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All in the family: reply to Burt, Podolny, and van de Rijt, Ban, and Sarkar

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We are grateful for the thoughtful reactions to our work by Burt, Podolny, and van de Rijt, Ban, and Sarkar (VBS). It is heartening to see that each of the commentators acknowledges the basic insight of our article. And we also appreciate their urging us to clarify the motivation for the model we developed, the assumptions we adopted in building the model, and the model's implications. We would like to express special thanks for the participation of Prof. Burt, who was and remains our teacher. We cannot think of a greater honor for students than for their teacher to engage with their work in such a serious fashion, especially when such work revises his original instruction.

We begin by clarifying the motivation for our article, and then use this motivation to frame our reply to the comments on the assumptions and implications of our framework. Of the three commentators, Podolny seems particularly skeptical of the motivation for our article, which he accurately characterizes as an attempt "precis(ely to . . . identify) the assumptions that underlie the structural hole model" (Podolny 2008: 971) and draw out the implications of those assumptions. Our rationale for undertaking that task is indeed worth questioning, especially because we agree with Podolny that (i) it is hard to find a more precise and influential sociological theory (Podolny 2008: 971) and (ii) the literature had essentially moved on, with scholars (including Burt, as reflected in his comment) typically accepting the basic logic of structural holes theory and "layer"ing (Podolny 2008: 973) other processes and factors upon this foundation. Indeed, each of the commentators seems to prefer a different question for orienting the article than the one we chose. Burt characterizes our article as asking, "Why do brokers do better on a broad array of performance outcomes?" Podolny seems to prefer that we ask, "When can actors successfully assume valuable network positions?" And VBS asks, "How can actors pursue advantageous positions when they cannot see the structure?" These are good questions, and we address them below. But our orienting question was a different one. We asked whether the network positions that grant incumbents the most knowledge are the same or different from the network positions that grant

the most power. Or to put it differently, we wished to know whether the answer to "ego's redundancy dilemma" given in the title of Figure 1 of our article—"After Alter 1, where should ego place her next links" was the same regardless of whether ego was interested in knowledge or power.

We had two main motivations for addressing this orienting question. First, like Podolny, we believe that Burt's *Structural Holes* (1992) gave a clear and compelling answer to this question, and we wanted to build and improve upon this answer. We recognize that Burt did not frame his original theory as an answer to our question, but rather as an answer to the question of which network positions are most valuable. But in answering the latter question, Burt implicitly asked and answered our orienting question. In particular, he made an important theoretical contribution, by integrating two research streams—the line of theory begun by Granovetter (1973), which asks, "Which network positions grant occupants the most information?," and the various lines of sociological (Emerson, 1962; Blau, 1964), organization-theoretic (Pfeffer and Salancik, 1978), strategic management (Porter, 1980), and economic (Galbraith, 1952; Caves, 1987) research, each of which deals with the question, "Which structural positions grant occupants the most power?"[1] Burt showed that the answers to these questions were related and perhaps even identical—i.e., that actors with many nonredundant contacts were advantaged, both with respect to knowledge-accumulation and with respect to power. However, we came to recognize that, embedded in the very logic of this answer was also the opposite answer, once one isolated the effects of nonredundancy on power in resource provision from its effects on power in resource acquisition. In sum, while it may be true that the literature had moved on from our orienting question, it is equally true that the vagaries of scholarly fashion sometimes cause us to overlook important questions, and such neglect is unfortunate when there is more to a question than had been apparent.

[1]In his comment on our article, Burt is too modest in characterizing his original contribution, in two related respects: (i) he characterizes his contribution (and that of work in the past 15 years) as empirical rather than theoretical; and (ii) he characterizes the predecessor lines of theory as having already been integrated. Like Podolny, we view Burt's original contribution as primarily theoretical in nature, and we see the key theoretical advance as one of bringing together two disparate theoretical traditions that had focused on different questions. Evidence for this assertion can be found in the countless course syllabi that include Burt (1992). While some syllabi may assign the empirical chapters (Chs 3 and 4), every syllabus assigns Chapter 1. To be sure, Burt's framework would have been less influential had he not also provided a set of methodological tools for testing his theory empirically (and conducting illustrative empirical analyses himself). But the motivation for using such tools derived from the theoretical contribution. Indeed, the name of the measures (e.g., "constraint" for a measure that could alternatively been given a theoretically neutral label like "network concentration" or one that reflected different theoretical objectives like "network specialization") reflects the embedding of the theory in the methods.

That there is "more to the question" is true not only in the narrow sense of the main lesson of our article—i.e., that it is ultimately indeterminate whether a network position that is optimized for knowledge-accumulation (i.e., a position built according to the nonredundancy or "NR-strategy") will also grant the incumbent of that position more power than a network position that minimizes knowledge-accumulation (the redundancy "R-strategy")—but also in a broader sense, which we began exploring in the discussion section of our article. In particular, once one identifies this power-as-provider/acquirer trade-off, one also begins to discern the outlines of a broad theoretical synthesis, the pursuit of which formed the second motivation for our article. This synthesis involves situating at least six trade-offs (listed in the second column of Table 1), each of which is well-known but whose relationships with one another has not been sufficiently appreciated, as members of the same "family" of NR/R trade-offs.

In our article, we sketched the relationships among these trade-offs and suggested that we may gain greater insight into each trade-off by casting it in the family of NR/R trade-offs. The relatively undeveloped nature of the sketch may account for why Podolny is so skeptical about the family resemblances we identify. In particular, he voices two reasonable worries about our model: (i) that while in our model, "actors simply assume their positions" (Podolny 2008: 974), it is the very difficulty of assuming a position that is subject of other purported members of the NR/R family; and (ii) that because our model focuses only on the consequences of different structural positions, it cannot incorporate identity-based trade-offs that are governed by a "logic of appropriateness" rather than a "logic of consequences" (March and Olsen, 1989). These are reasonable worries. But the family resemblances among the trade-offs are too strong to ignore. Thus, we now take the opportunity to add a bit more color to our sketch and show how these worries can be alleviated. In particular, we hope to show in the next section how Podolny's concerns can be addressed by distinguishing between four different levels or "orders" at which the NR/R trade-offs are experienced (Table 1): two orders of *action* (short and long term), whereby environmental conditions govern the differential risks and returns of an NR- versus R-strategy; the order of *actor capacity*, whereby actors face differential risks and returns from improving their efficiency at NR versus R action; and the order of *actor identity*, whereby actors face differential risks and returns from attempting to become socially defined as someone capable of NR versus R action. We also discuss how the main issues raised both by Burt (*Shouldn't ego's capacity for absorbing and translating across boundaries increase with brokerage, thereby lessening the trade-off? How do we reconcile our framework with Burt's findings that suggest that the source of nonredundancy that defines ego's redundancy dilemma does not affect returns to brokerage?*) and VBS (*How can ego pursue a NR-strategy when she cannot see the structure?*) are addressed by this framework.

Table 1 The NR/R family of trade-offs

	Trade-off (NR-strategy/R-strategy)	Conditions favoring: NR-strategy (versus. R-strategy)
First Order: short-term action	1a. Power: Provider/Acquirer	Current demand for resources: exotic (versus. Homophilic)
	1b. Knowledge production: Exploration/Exploitation	Current demand for knowledge: novel (versus. Incremental)
Second Order: long-term action	2. Demand-fit: Generalism/Specialism	Changes in demand for resources or knowledge: volatile/coarse (versus. stable/fine)
Third Order: actor capacity	3. Cosmopolitan/Local	Value of building cosmopolitan capacity (versus. local capacity)
		Ease of building cosmopolitan capacity (versus. local capacity)
Fourth Order: actor identity	4a. Robust/Focused	Demand for cosmopolitan actors (versus. local actors)
	4b. Stranger/Insider	Salience of intraclass competition (versus. interclass competition)

1. NR versus R: tracing a (querulous) family tree

We contend that the trade-off that served as the focus of our article, between power-as-provider and power-as-acquirer, can be usefully understood as just one branch of a family tree, the common element of which is a trade-off in the "schedule of returns" that can be expected to result from depth versus breadth in an actor's line of action (both short and long term), her capacities, and/or her identity. The six trade-offs mentioned in our article are listed in Table 1, where they are mapped into each of the four orders. We will now clarify the relationships among the trade-offs at each order, beginning with the first and second action orders, which undergird the "higher" orders. We will then discuss the third (capacity) and the fourth (identity) orders in turn. In so doing, we will use the framework to address the concerns raised by the commentators, as summarized above.

1.1 First and second order trade-offs: NR versus R lines of action

To recall, the main point of our article was to show that there is no clear resolution for "ego's redundancy dilemma" because the returns associated with the R-strategy are counterbalanced against those that accrue from the NR-strategy. The R-strategy is optimal under conditions of homophilic valuation (where valuation is decreasing in the distance a resource has traveled), while the NR-strategy is the best course to

pursue under uniform valuation (where valuation is independent of distance traveled). Moreover, while not modeled in our article, it is worth stressing that the NR-strategy is particularly advantageous where valuation is exotic—i.e., where valuation is increasing in the distance a resource has traveled.[2] Since each type of valuation regime is observed in the real world and since one often cannot know which valuation regime will pertain *ex ante*, it is rarely clear which strategy one should pursue. We further conjectured that homophilic valuation is probably more common, thus making an R-strategy the safer bet, but that less homophilic valuation regimes promised much greater returns to an NR-strategy than is available from any R-strategy.

In our article, we modeled ego's returns in terms of surplus, or the returns associated with exercising power in exchange. And as discussed above, the main advantage of modeling the NR/R trade-off in this fashion is that the power-as-provider/acquirer trade-off had not been appreciated in past research. However, we could equally have demonstrated the indeterminacy of ego's redundancy dilemma by modeling returns in terms of one of two other, more familiar trade-offs that pertain directly to the conflicting schedule of returns associated with deeper versus broader lines of action: exploration/exploitation (March, 1991) and generalism/specialism (Hannan and Freeman, 1977; Freeman and Hannan, 1983; Hannan *et al.*, 2007: Ch. 9). As depicted in Table 1, all three of these trade-offs pertain to the consequences of broader versus deeper lines of actions, with the first two pertaining to short-term returns and the third pertaining to long-term returns.

To see this, we present the results from the simulations in our article in a slightly different way. In modeling information-exchange in our article, we assumed that: (i) all "bits" of information are easily acquired; (ii) each bit is a self-contained piece of knowledge; and (iii) the knowledge has already been produced. These assumptions are useful for capturing knowledge *accumulation* in the simplest sense, where being more knowledgeable involves amassing as much codified (i.e., with no need for interpretation) information as possible, and for using the exchange of such codified information as a platform for examining the surplus gained from exercising power while providing and acquiring such information. And the fact that these assumptions

[2]It is appropriate at this point to clarify the relationship between the exotic/homophilic contrast and Centola and Macy's (2007) distinction between simple and complex contagions, where the later diffuse only when at least two alters offer ego a piece of information. As mentioned on p. 933 of our article, the two contrasts are related and produce similar effects when exotic/homophilic is operationalized as we did. But they are not the same [as Burt (see Burt 2008, pp. 964–965) suggests], and they would produce different effects if operationalized somewhat differently. The key differences are: (i) Exotic/homophilic pertains to how valuation changes as a function of the structural distance between ego and *the original source* of a resource (e.g., ego could have two friends who have both adopted an exotic good); and (ii) indirect ties—i.e., structural equivalence—are incorporated in our measure of structural distance. We included two-step ties in our calculation of homophily, but one could imagine including three-step ties and beyond, in which case homophilic valuation would look increasingly different from a preference for having multiple sources.

capture an important slice of reality can be seen in the influential lines of research that have adopted such assumptions (Granovetter. 1973; Buskens and Yamaguchi, 1999; Watts and Strogatz, 1998).[3] In many cases though, the latter two assumptions do not apply because the knowledge must be *produced* by "puzzling through" a set of data points or experiences and synthesizing them to arrive at a new understanding (which may be embodied in a new set of routines, as in the case of mastering a surgical procedure; see Reagans *et al.*, 2005). And the first assumption often does not apply because successful completion of such a puzzle does not come from the first try, but requires sustained investment in interacting with, and trying to solve, the puzzle. In short, and as is well-known, knowledge acquisition often follows a learning or experience curve, whereby greater understanding increases with greater engagement with the task or puzzle (Argote, 1999).

And yet, while our model would seem not to be able to incorporate knowledge production, one can in fact use it to capture such production and accordingly, the exploration/exploitation trade-off. Consider the results presented in Figures 1 and 2, which were generated with exactly the same simulation rules described in our article, and applied to the networks in Figure 3 of our article. In effect, these results are just another way of casting the results presented in Table 2 of our article. To produce the results in Figure 1, we assume that an actor's return is increasing in the speed at which she succeeds in amassing 3 bits. That is, we consider each unique 3-bit combination (not including ego's bit), of which there are 364, to be a puzzle that cannot be solved until she accumulates all 3 bits. To produce the results in Figure 2, we assume that the actor's return is increasing in the speed at which she solves each of the 3003 6-bit puzzles (by amassing all 6 bits). And for each puzzle size—which we use to capture variation in puzzle simplicity/complexity—we compare the extreme cases of NR and R—i.e., ego's choice between scenarios 1 and 4 in Figure 3 of our article. Faster completion times allow an actor to accumulate more experience with a puzzle and thus to learn by doing, which in turn allow the actor to become more efficient and effective over time.

[3]It is appropriate at this point to respond to Burt's concern, voiced on p. 958 of his comment, regarding our assumption that each node is endowed with a unique bit of information. He points out that it is generally more accurate to assume that information is "clustered" such that more proximate nodes share more information than do more distant nodes. We completely concur with this observation, as our framework is expressly predicated on the fact that the likelihood that two nodes share a "bit" is increasing in their proximity. This is what allows nonredundancy to create nonsubstitutability. Accordingly, except at the beginning and end of each simulation, Burt's equation for shared knowledge in a dyad (Burt 2008, p. 958) holds. And there are significant advantages in modeling the initial distribution of information as we did. In particular, this approach: (i) allows clustering to be produced through exchange rather than to be assumed; and (ii) allows us to examine the surplus that actors earn as such exchange occurs.

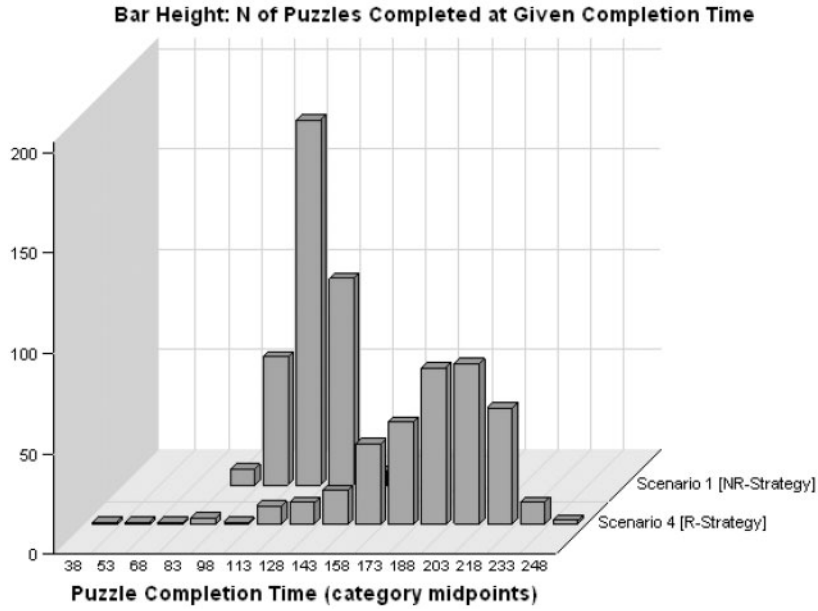

Figure 1 Simple (3-bit) puzzle completion rates, by scenario 1 and 4 from Figure 3 in Reagans and Zuckerman (2008a). Bar Height: Number of puzzles completed at given completion time.

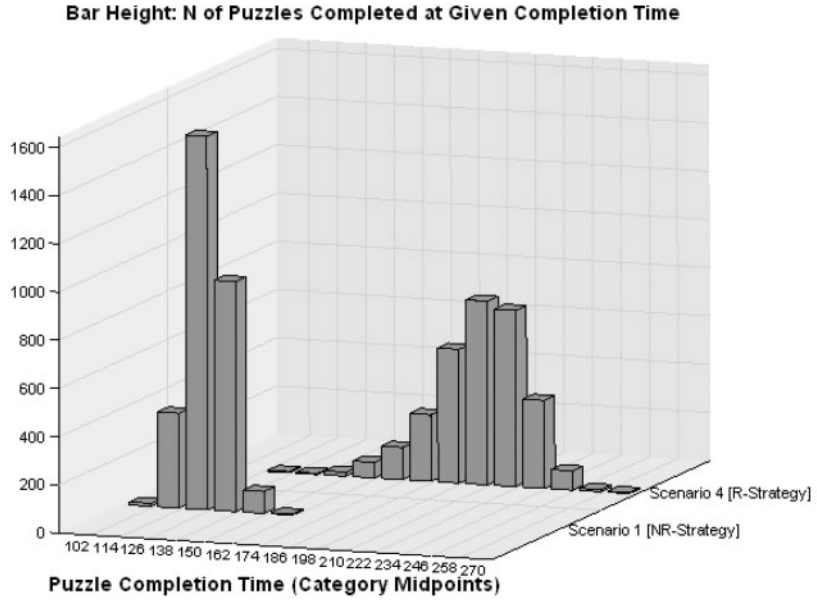

Figure 2 Complex (6-bit) puzzle completion rates, by scenario 1 and 4 from Figure 3 in Reagans and Zuckerman (2008a). Bar Height: Number of puzzles completed at given completion time.

1.1.1 First order

The results are straightforward but instructive. First, we see that if ego's return depends on her solving any simple (i.e., 3-bit) puzzle, the R-strategy (scenario 4) is most attractive because ego completes her first puzzle under this strategy at a much faster rate (44.5 interactions) than she completes her first puzzle under the NR-strategy (83.6 interactions). This is the classic benefit of rapid, incremental improvement associated with "exploitation." On the other hand, if ego's return depends on her solving any complex (i.e., 6-bit) puzzle, the NR-strategy is most attractive to ego because she completes her first complex puzzle at a much faster rate (103 interactions) than she does under an R-strategy (130.8). This is the characteristic benefit associated with exploration—i.e., discovering a novel recombination that constitutes a major improvement on existing solutions.

And as with the pursuit of surplus via the exercise of power, it is impossible to say whether R (exploitation) or NR (exploration) should be pursued. In both cases, the primary reason for this indeterminacy is that different valuation regimes are possible and it is often difficult to know *ex ante* which applies.[4] Just as the advantages of pursuing power as a provider versus acquirer depend on whether valuation is more exotic or more homophilic, the advantages of pursuing an explorer versus exploiter approach to knowledge production turns on whether there is greater demand for more incremental versus more novel solutions. The results in Figures 1 and 2 also help illustrate a second point, which reinforces our observation that the R-strategy tends to promise safer but more limited returns, while the NR-strategy promises the potential for much greater returns but carries more risk. In particular, since the R-strategy affords the fastest completion time of any puzzle, insofar as there is value in solving any puzzle more quickly, this strategy is the safest bet. But what if puzzles vary in their value, with the solution of some being of no value and the solution of others having great value? An NR-strategy promises the greatest returns because it exposes ego to the largest number of novel combinations. Thus, if a highly valuable novel solution exists, she is in the position to find it. On the other hand, given the much greater time it takes to find such a solution (which could be said to represent the uncertainty of the basic research process) and the uncertainty of whether the novel solution will be appreciated (analogous to development and marketing challenges), the risks are quite high as well.

1.1.2 Second order

In a moment, we will turn to a key issue that pertains to the prior discussion and which was raised by Burt—i.e., that valuation regimes are not given in nature, and it is often possible for certain actors to develop capacities for overcoming them to a certain

[4]Moreover, if everyone knew with certainty which strategy should be pursued (and everyone was equally capable of pursuing such a strategy; see the next section on third-order issues), that strategy would offer much lower returns due to competition (cf., Knight, 1921).

extent [e.g., by taking an exotic good and "translating" it so that it is more palatable to members of a local cluster (Canales 2008: Ch. 4)]. Yet it is important to stress that in the first instance, a given individual has little control over the dominant valuation regime used by others, and will suffer from a lower return if she focuses on producing exotic goods or developing novel solutions and then it turns out that relevant audiences favor local goods and incremental solutions. Moreover, by conceiving of valuation regimes as environmental conditions that may favor R-strategies (by favoring local goods and incremental solutions) in some cases and NR-strategies (exotic and novel) in others, we can use the results in Figure 1 to illustrate how these first-order action-based trade-offs relate to the second-order action-based trade-off: generalism/specialism. These three trade-offs share the feature that it is possible to characterize the benefits of NR versus R strictly in terms of a schedule of returns that accrue to a broader versus a more focused line of action. They differ in terms of the time frame involved. The first two trade-offs pertain to short-term returns, with the size of those returns depending on the nature of *existing* (if unknown) valuation regimes (exotic versus homophilic; novel versus incremental). In contrast, the trade-off between generalism versus specialism applies to returns over longer spans of time, where changes in the first-order valuation regimes govern such long-term returns.

To see this, reexamine the results in Figure 1. We asserted before that this distribution of completion times for simple puzzles favors the R-strategy. But this assumes that there is high demand for the specific puzzle that the R-strategy is optimized for solving (in particular, the puzzle that is solved by accumulating bits from each of ego's alters and their common alter). This may be true for a short period of time, but tastes are fickle. It is likely that demand will eventually privilege other puzzles. And if demand can be expected to be highly volatile, it will make sense not to optimize for any particular puzzle, but to follow an NR-strategy and thereby be in position to solve many puzzles reasonably well. Indeed, since the NR-strategy is not optimized for any one puzzle, its average completion time for both simple and complex puzzles is lower than that for the R-strategy. The long-term question then is whether demand will be volatile or stable.[5] If it is stable, an R-strategy (specialism) focused on current demand promises the highest returns; if volatile, the NR-strategy (generalism) is most attractive. So over the long term as well, the answer to "R or NR?" is indeterminate.[6]

[5]A caveat is that volatility will privilege generalism only where demand is "coarse-grained" (Hannan and Freeman, 1977; Freeman and Hannan, 1983; Hannan *et al.*, 2007: Ch.9)—i.e., where solutions or resources are very different from one another (e.g., there is no overlap in the "bits" between the solutions that are preferred in t_1 and t_2). If demand is fine-grained, volatility may not privilege generalism.

[6]As the previous footnote suggests, these assertions require relatively strong *ceteris paribus* disclaimers. And one might also question the utility of distinguishing between the short and long term. Clearly, such a distinction requires some (necessarily subjective) assessment of the time frame that it takes to switch from one (NR or R) strategy to another as compared to the change in the valuation regime. Considering illustrative cases may help to alleviate any uneasiness about the

1.2 Third order: NR versus R capacities

To motivate our discussion of the third-order trade-off, it is useful to consider the doubts voiced by Burt regarding the general salience of the network positions depicted in Figure 1 of our article. This skepticism stems from the fact that these positions "only differ in indirect contacts"—i.e., the R-strategy involves choosing alters who are indirectly connected, while the NR-strategy involves choosing alters who are not indirectly connected, but no pair of either set of alters is *directly* connected.[7] This contrast seems unimportant to Burt because "the evidence in Table 2" (Burt 2008, p.963) suggests that "indirect contacts are irrelevant to the performance association with network brokerage" (Burt 2008, pp. 963–964). The evidence in this table indicates that brokers have an advantage when brokerage is measured in terms of direct connections among alters but not when brokerage is measured in terms of indirect contacts. This leads Burt to infer that:

> the active ingredient in the broker's advantage is not access to information, it is the cognitive and emotional *skills* that develop as a by-product of living with divergent information. The bridge relations that connect network brokers across groups, expose the brokers to divergent opinion and practice (Burt 2008, pp. 962–963, emphasis added)

In short, Burt argues that while brokerage based on an NR-strategy can be expected to obtain more information than that brokerage based on an R-strategy, *either strategy* can be expected to help ego build valuable *skills* or capacities, so long as the network positions do not involve connected alters. And the types of skills that Burt emphasizes are those that, following longstanding sociological precedent (Simmel, 1950a), we labeled *cosmopolitanism* in our article.

We agree with Burt in three critical respects on the subject of cosmopolitan capacities. Our first point of agreement is that such capacities exist and help some actors derive value from occupying a brokerage position to the point that the downsides of the position pale in comparison. In the language of Burt's Table 1, such

analytic utility of such a distinction. For example, see Zuckerman (2000: 614–615; cf., Davis *et al.*, 1994) on corporate de-conglomeration, and see Ferguson (2008) on the breakdown of union jurisdictions. The former case represents a shift from an exotic regime to a homophilic regime, which stimulates a shift from generalism to specialism; the latter case represents a shift from a homophilic regime to an exotic regime, with a resulting shift from specialism to generalism.

[7]It is important to note that the NR/R trade-off can also be captured by restricting attention to variation in direct links among alters. Accordingly, contrast the results for scenarios 1 and 2 (disconnected alters) versus scenario 3 and 4 (connected alters) in Tables 1–4 of our article. And note the results for "ego-density" in Table 4.

a cosmopolitan enjoys "greater advantage" and the "tension (due to reliance on a single source) is alleviated."

Our second point of agreement concerns the mechanisms that underlie such capacities. In particular, Burt emphasizes the cosmopolitan's ability to *absorb* new and unfamiliar knowledge, as well as her ability to translate or *transfer* such knowledge (see also Reagans and McEvily, 2003, 2008). Together, these abilities provide the benefits of what Burt terms "triadic pricing," whereby the cosmopolitan enjoys lower production and distribution costs in acting as a middleman or arbitrageur between disparate social worlds.[8] For instance, a cosmopolitan may be so good at translating exotic goods into local terms that she can turn a relatively homophilic regime to her advantage (Canales, 2008: Ch. 4). Moreover, we agree that successful brokers may be able to earn additional capacity to manage more links, which would then alleviate the trade-off we identified.

Finally, we agree that such capacities are both exogenously and endogenously determined, with such endogeneity captured in the second sentence of the excerpt from Burt's comment reproduced above. That is, cosmopolitan capacities can be *cultivated* by exposing an actor to a wide array of "opinion and practice." Such cultivation or education helps the "student" both to digest the information that is presented and to integrate and digest new information that is yet to be presented. For instance, while an actor's completion times of a complex puzzle may be very high the first time such a puzzle is encountered, engagement in such exploration may be worthwhile over the long term if it creates a greater capacity for solving such complex puzzles as well as for anticipating which complex puzzles will be most tractable. Similarly, while the actor's first attempt at arbitrage between disconnected markets may fail, such failures often create greater capacity (for absorbing disparate resources; translating them across boundaries, and discerning which arbitrage possibilities are most likely to succeed), raising the likelihood of success in later attempts.

While we have identified three important points of agreement in how we and Burt conceive of cosmopolitanism and how it may help overcome the first- and second-order trade-offs, we must also note two key differences. First, our framework points to the dangers of focusing on cosmopolitan advantages *ex post*. As stressed in our original article and in the last section of this article, any NR-strategy incurs the risk

[8]At the same time, we disagree that a different model of pricing is required to capture these advantages. In particular, the lower costs of absorption and distribution mean that the seller is able to produce knowledge more efficiently, while success in translation implies a higher willingness-to-pay on the part of a buyer. In short, while cosmopolitan-based advantages may generate different levels of *surplus* for the same line of action, such surplus is earned through exchanges where price is driven by the familiar factors that are built into our model. Observe in this regard that such surpluses can be expected to decline due to increased rivalry once news of the surpluses begins to spread (Burt, 2005: 230–232).

that demand will turn out to favor an R-strategy (i.e., incremental improvements are preferred over novel solutions; local goods are preferred over novel goods; and demand is fine-grained and stable). In addition, insofar as cosmopolitanism involves analogical reasoning across diverse knowledge domains, it relies on "weak methods" (Simon, 1990: 9), which carry the risk that more direct experience and expertise will prove more effective or valuable. Moreover, just as cosmopolitan capabilities are cultivated (i.e., endogenous to particular lines of action), so are *local* capabilities. In his comment, Burt is articulate about the importance of local, often tacit knowledge in many local contexts, which create language barriers that hinder interchange with outsiders (see Burt 2008, p. 957). A key implication of this is that local capacities grow with immersion in local "opinion and practice," just as cosmopolitan capacities grow from immersion in a broad array of "opinion and practice." And this implies that *ex ante*, a decision to develop cosmopolitan capacities (through an NR line of action) implies a foregone opportunity to develop a local capacity (through an R line of action). As Burt stresses, this trade-off can be alleviated *ex post*, if the cosmopolitan enjoys such high returns that she can also create local capacities and/or if her cosmopolitan skills grant her local skills as well. But again, one cannot ignore the significant *ex ante* risks that such cosmopolitan skills will not develop significantly or will be as valuable as local capacity would have been.[9]

Our second point of disagreement concerns the structural foundations of cosmopolitan versus local capabilities. In particular, whereas we agree that cosmopolitanism grows from exposure to and experience with "divergent opinion and practice" (Burt 2008, p. 963), we disagree that, in network terms, such divergence is fully captured by whether one's alters are directly connected. We think that this expectation does not follow from the premise, which both we and Burt embrace, that information as well as "opinion and practice" is generally clustered such that the more structurally distant two actors are the more likely are their opinions and practices to diverge. This premise leads us to expect that such divergence is decreasing in *both* dimensions of alter-redundancy—i.e., whether alters are directly *and* indirectly connected. That is, *cosmopolitan capacities are NR capacities*, both in the sense that they hold the potential of making NR-lines of action more valuable (i.e., higher first- and second-order returns than would otherwise be expected) and that such capacities increase (at uncertain rates) from pursuing an NR-strategy of action. In network analytic terms, we expect such capacities to be most closely associated with the middleman positions that develop from following the NR-strategy, as depicted in

[9]To be sure, a consideration of the second-order trade-offs suggests that actors who are successful in developing local capacities face a longer-term risk that they will become myopic and thus more likely to miss long-term changes in demand.

Figure 1 of our article, rather than the "local broker" or *tertius gaudens* (Simmel, 1950b) position associated with the R-strategy.[10]

1.3 Fourth order: NR versus R identities

In the previous section, we discussed how the trade-offs at the level of action are reinforced at the level of capability. In short and as summarized in Table 1, the pursuit of cosmopolitan capabilities promises to maximize the returns available from following an NR-strategy and perhaps even to overcome the downsides of following an R-strategy; but these potentially high returns are counterbalanced by the significant risks that: (i) the valuation regime will prove highly resistant to the fruits of cosmopolitan skills; and/or (ii) the development of valuable cosmopolitan capabilities proves to be very challenging. Moreover, there are two additional and related risks that pertain to using an NR-strategy to develop cosmopolitan skills, and these risks pertain to the fourth-order NR/R trade-offs, which concerns *identity*. In particular, even an actor who succeeds in developing cosmopolitan skills may not be given license to use such skills unless she has achieved recognition for having a cosmopolitan identity, and such an identity is acceptable/desirable to the various local audiences or markets with whom the actor wishes to transact. The topic of identity is vast and touches on many issues that do not pertain to the NR/R family of trade-offs, so we will confine ourselves here only to substantiating the assertion in the last sentence, to showing more generally how the NR/R framework can accommodate Podolny's concerns, and how it relates to both Burt's and VBS's observations regarding identity.

[10]How then can we explain the fact that Burt (2007) finds that indirect contacts are "irrelevant" to brokerage? It is important to recognize that while Burt's second measure incorporates indirect ties, it does so in a way that does not allow it to capture the aspect of the NR/R distinction that is missing from the first measure—i.e., whether alters are indirectly connected or structurally equivalent. Burt (2007) labels the second measure "indirect network constraint" or the average constraint experienced by ego's alters, where constraint (the first measure presented) is increasing in the extent to which an actor's contacts are directly connected (Burt, 1992). While indirect constraint measures the extent to which ego is connected to constrained alters, the source of indirect constraint is not distinguished. Let us assume that ego's contacts are disconnected from each other. Consider the situation where indirect constraint is high because ego's alters are indirectly connected to each other. Under this scenario, the contacts are *redundant via structural equivalence*. Now consider the situation where indirect constraint is high because ego's contacts are drawn from different clusters but relationships inside each cluster are dense. In this scenario, ego's contacts are *nonredundant via structural equivalence*. In each scenario, indirect constraint is high. But in the first scenario, ego is pursuing the R-strategy illustrated in Figure 1 of our article, while in the second scenario, ego is pursuing a version of the NR-strategy. In short, while Burt's results are interesting, they do not pertain to the issue at hand. It is instructive, however, that Burt reports that he finds significant effects for indirect constraint in industry networks. This may be in part because Burt's measure of constraint in such analyses implicitly incorporates structural equivalence in its measure of industry.

VBS's comment is particularly helpful for framing this discussion in that it hints at what identities are and why they emerge. In particular, VBS characterize a system of identities as a guide to uncovering an underlying distribution of information (and by extension, capacities). Observe two implicit assumptions, which are (appropriately) embedded in this characterization, and which are discussed in greater detail by Zuckerman (2008). First, VBS assume identities are used by (and implicitly, emerge due to usage by) actors who seek certain flows of action (or a stock of action—i.e., resources such as information) from others but cannot know *ex ante* who is most likely to deliver such action. Alter's identity thus provides *ex ante* guidance as to which actions he is most likely to deliver to ego. Second, VBS assume that while the distribution of information (or capacities) is hard to observe, identities are more readily observable. This difference in observability lies in the definition of an identity as a *consistent placement* (Zuckerman, 2008), where placements (Stone, 1962) pertain both to extension (i.e., how much space does the entity take up?) and location (where is it relative to other entities?), and where consistency of a placement pertains to its stability over time and to agreement across observers (including but not limited to the subject of that identity).

In their model, VBS implicitly assume a high level of consistency in placements, along both dimensions. But whence does this consistency derive? Note that whereas one might think that the basis for such consistency resides in the identities' mapping into underlying actor characteristics, VBS assume that the identity system is equally consistent when it essentially refers to nothing. This is because the key mechanism that underlies consistency of identity is *common knowledge*—i.e., what everyone knows about what everyone knows—and common knowledge does not change on the basis of private discussions (e.g., within a particular dyad) but public discourse (see also Chwe, 2001; Swidler, 2001; Adut, 2005; Ridgeway and Correll, 2006); and public discourse incorporates private knowledge slowly and unevenly. Indeed, many environments display high degrees of pluralistic ignorance, whereby there is significant private dissent from a public evaluation of some actor or institution, masked by public conformity to this evaluation (see especially Centola *et al.*, 2005). In short, VBS's analysis nicely captures the paradox that on the one hand, identities are used by audiences to guide their selection of actors for the actions and resources they control; but on the other hand, they are often misleading guides because they fail to incorporate relevant knowledge.

This general observation takes us back to the two risks mentioned at the outset of this section. In particular, while we have mentioned risks associated with following an NR-strategy, both at the level of action and the level of capacity-building, there are additional risks—and opportunities for returns—that pertain at the level of identity. As Podolny suggests, it is useful to characterize those risks in terms of *appropriateness*. That is, even when ego is capable of undertaking the desired action or delivering the desired resource, ego may fail to be selected by alter because ego does not "look or act the part"—i.e., ego does not display the actions or

characteristics that are publicly recognized as belonging to the identity that alter uses to guide her selection. Insofar as identities are accurate representations of the underlying qualities they are supposed to reflect, then issues of appropriateness are irrelevant. That is, ego can attend directly to how well her audience of alters is likely to appreciate the actions and resources ego can achieve, and the capabilities ego can develop, from pursuing a broad or a deep line of action. "The logic of consequences" is all that matters.

But in many cases, such audiences will use ego's appropriateness as a screening device, and this creates two characteristic difficulties for those who pursue cosmopolitanism. First, and as discussed in our article (based on Zuckerman *et al.*, 2003), audiences for a particular kind of service often engage in some form of typecasting, whereby actors who participate in a broad set of activities are presumed, in the first instance, to be (less committed to and thus) less capable in the service the audience seeks. Effectively, the "role expectations" of various audiences tend to be "divergent (Podolny 2008, p. 975)." Such typecasting tendencies are reasonable, in that focus may generally be a good indicator of skill in an area, but they are crude, in that it means that "Jacks" who truly are able to masters many "trades" will get to participate in none. Second, once certain resources become attached to a given category or class of actors, an interest is created in their *enclosing* that interest by protecting it from others (Weber, 1978).[11] As Burt points ut in his comment, and as we have discussed elsewhere (Gabbay and Zuckerman, 1998; Reagans and Zuckerman, 2001; Reagans *et al.*, 2004; see also Reagans and Zuckerman, 2008), members of a class benefit from dense set of relations internally because it helps them protect common resources, develop common capacities, and increase their collective power to extract resources from the larger system. Moreover, this creates a corresponding interest in distinguishing insiders, who are accorded rights to those resources, from outsiders, who are blocked from the class's resources. Thus, the second identity-based risk to the NR-strategy is that ego is blocked from transacting with local cluster members because she becomes regarded as an outsider.[12]

The foregoing considerations suggest significant identity-based risks associated with pursuing an NR-strategy. But actors sometimes do succeed with such strategies, and in fact many of our paragons of success are actors who succeed in bridging

[11]As is well known (e.g., Marx, 1968), a shared interest among actors is insufficient for these actors to coordinate their efforts, but it is necessary.

[12]Burt (1992: Ch.4, 1998) provides an excellent illustration of this issue. He shows, in an analysis of a large corporation in the 1980s, that women were unsuccessful at pursuing NR-strategies because they were viewed as "illegitimate." Burt further shows that men faced legitimacy issues only before they established themselves within the top ranks of the firm, which suggests that the identity-based blockage in this case was of the second type (i.e., stranger/insider) discussed here (which cannot be alleviated by demonstrating skill).

between many different worlds. One explanation for this, as given in Table 1, is that such actors succeed in contexts where audiences value what cosmopolitan actors can deliver (novel solutions; exotic goods) over local actors. A more nuanced version of this explanation can be gleaned from Burt's observation that "Relatively homogeneous opinion and practice within closed networks is what makes brokerage across networks valuable (Burt 2008, p. 957)."[13] This suggests that audiences primarily screen on localism, but they are often receptive to cosmopolitan actors under certain conditions. In particular, once an actor has demonstrated the commitment and skill necessary for achieving recognition as a member of the specific category that defines localism, her cosmopolitanism will be less suspect (cf., Phillips and Zuckerman, 2001; Zuckerman *et al.*, 2003). This relates to the paradox of identity given above. That is, the fact that identities are crude guides to underlying capacities allows actors who have successfully assumed an identity to engage in action that would otherwise be considered inappropriate for that identity.[14] And yet, the catch-22 is that the R-based line of action that helps such an actor attain a focused, local identity often makes it more difficult for her to gain the necessary entrée into other categories, and thereby to develop more cosmopolitan capabilities.

Finally, and as discussed in our article, there are characteristic advantages associated with being an outsider or stranger, in Simmel's (1950c) sense, even when closure is strong. In particular, the emergence of categories of actors has two effects. First, it creates a basis for closure, which thus makes it necessary to be recognized as an insider in order to obtain resources that are allocated to members of the category. Second, it sows the seeds of *internal competition* for status or priority in accessing such resources (Reagans, 2005). And this internal competition creates a role for the stranger who, because she is blocked from gaining access to group resources, is paradoxically in good position to traffic in exotic goods or novel solutions, insofar as there is demand for them and she does not use the proceeds to compete with insiders.

2. Coda: closure and merging R with NR

We close with an observation about managing the NR/R trade-off. We have emphasized in our article and again in this reply to the stimulating comments generously offered by Burt, Podolny, and VBS, that actors face a fundamental, if

[13]Note that whereas Burt suggests that such clustering in opinion and practice derives from closure, our framework suggests that closure reinforces clustering tendencies that operate at lower orders. For instance, closure is not necessary for members of the same trade (who have invested in similar capabilities) to have similar opinions or employ similar practices.

[14]Phillips and Zuckerman (2008) discuss boundaries on such inappropriateness and point to a range of actions for which deviance is *particularly* problematic for actors who have gained status within a category.

often implicit, choice between two opposing lines of action, which are the foundation for opposing capacities and identities. This may be a somewhat depressing lesson since it seems natural to want to combine both. Accordingly, witness the growing literature that seeks ways for organizations to be "ambidextrous" (Tushman and O'Reilly, 1996). We do not mean to imply that ambidexterity is impossible. Indeed, while we have focused on the NR/R trade-off at the level of the individual actor, it is important to recognize that an *organized collection* of actors can potentially navigate the trade-off quite effectively, if never quite eliminating it.[15] For instance, it is possible for an organization to have a research division that is geared towards exploration and efficient manufacturing and marketing divisions that are predicated on exploitation. Put differently, while our discussion above suggests that closure is built on top of redundancy, this need not be the case. Accordingly, we have elsewhere discussed the advantages of an interorganizational collaboration among locally-focused members (Zuckerman and Sgourev, 2006) as well as a cohesive team of cosmopolitans (Reagans and Zuckerman, 2001; Reagans *et al.*, 2004). In such cases, the resources used to build closure represent costs in that such resources could have been invested elsewhere, either in each local's existing R-strategy or in the cosmopolitans' separate NR-strategies. But such costs often pale next to the benefits (and pleasures) that such collaboration can bring, making the trade-off quite worthwhile.

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[15]The trade-off reemerges whenever the collective actor must allocate a finite resource like time or status to both R and NR. Thus, for example, while it is possible for an organization to have enough capital to invest both in explorer and an exploiter capability, it can never allocate enough status to both since status is a positional good (Hirsch, 1976). That is, insofar as every firm has a common status hierarchy (which denotes which actions and functions are most valued and which are less valued), and insofar as NR and R pursuits require opposing lines of action, conferring value for one will be tantamount to degrading the other.

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