

Note on Family Versus Network Closure as Foundation for Distrust and Lack of Cooperation

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I had a moment of surprise and embarrassment recently. My colleague, Vincenzo Perrone, had been head of the management department at Bocconi and was thinking through research on networks grounded in events. We met over a nice Milanese lunch to talk about the department and current network research. Vincenzo mentioned a research paper that made me realize that I had ignored in a recent publication an important line of work that was familiar to me!

Vincenzo pointed out similarities between an analysis by John Ermisch and Diego Gambetta in the 2010 *Journal of Economic Behavior & Organization* (JEBO) and an analysis I had forthcoming with my wife, Sonja Opper, in *Organization Science* (Burt, Opper, and Holm, Forthcoming). The gist of Sonja and my “closure-cooperation” hypothesis is that reputation governance within closed networks facilitates trust and cooperation inside the network, which creates a sense of risk in cooperating with people beyond the network’s reputational governance. The more comfortable the network around you, the more risky seem relations beyond the network. People in closed networks are predicted to be relatively uncooperative with people beyond their network.

Where Sonja and I focus on network closure, Ermisch and Gambetta focus on family. The gist of their “family-trust” argument is that people deeply embedded in a family network do not learn the skills required to comfortably engage in relations with people outside the family. The prediction is that people deeply embedded in family are more likely to distrust people outside the family.

I was not familiar with the 2010 JEBO paper, but I knew well Diego’s related book on the Sicilian Mafia as a source of protection for family-embedded people dealing with people outside their family (Gambetta, 1988:Chp. 10, 1993, 2011), which built on Banfield’s (1958) description of people in a village to the south of Italy being so deeply embedded in family networks that they were suspicious of cooperation with outsiders, even neighbors. That is echoed in Gans’ (1962) description of Italians in Boston’s West End being unable to save their neighborhood from urban renewal because they were embedded each in their own family network and suspicious of neighbors outside their network, which Granovetter (1973:1373-1376) famously uses as an illustration of disadvantage from a lack of bridge relations between groups. The same origins underlie Putnam’s (1993) use of Coleman’s (1988) social capital metaphor to describe the lack of trust and civic participation in south relative to the

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north of Italy. Putnam (1993:146) quotes from Gambetta in describing the south: “Distrust percolates through the social ladder, and the unpredictability of sanctions generates uncertainty in agreements, stagnation in commerce and industry, and a general reluctance towards impersonal and extensive forms of cooperation.” Recent empirical work on the Gambetta and Putnam themes includes Alesina and Giutiano (2011) and Herreros (2015) using international opinion surveys to show distrust and low civic participation correlated with strong family ties (Alesina and Giutiano provide a fulsome literature review).

Banfield (1958), Gans (1962), Gambetta (1993), and Putnam (1993) are familiar works, and obviously relevant to my analysis with Sonja of closed networks and cooperation — but none are cited in our article. I was surprised at missing the connection when Vincenzo highlighted it. (Ignorance finds unearned victory in our frequent neglect of what we already know. Thank goodness for colleagues like Vincenzo to remind us of the neglected bits.)

The family versus closed-network arguments are not isomorphic, but they are so closely related that synergy seems likely. Both arguments focus on the consequence for trust and cooperation of a network boundary between adjacent governance mechanisms: the safety of insider relations governed by reputation or kinship norms, versus the uncertainty of relations with outsiders absent such governance. Empirical questions generated by the contrast include:

How strong on average is the effect of network closure on trust and cooperation beyond the network?

How much does the average effect vary with time/experience in the closed network? For example, does a lifetime in one’s family, combined with no experience of outsiders strengthen the average effect?

Under what conditions does the average effect not occur? For example, does a dysfunctional family encourage relations with outsiders?

And what are the implications of answers to these questions for society? Society now seems to be balkanized into groups of like-minded people who have little patience for individuals of other minds. Social media algorithms feed us news consistent with what we want to know, and shield us from contrary news. Mass media exposes us more than ever before to the egregious behavior of people who think in ways different from us. It is difficult to know what to believe or who to trust beyond our immediate circle (Baldassarri and Abascal, 2020; Brady, McLoughlin, Doan, and Crockett, 2021; Opper, Forthcoming).

The two hypotheses can be loosely or tightly integrated. Tight integration would be to understand the boundary around family as an example of the boundary around closed networks more generally. Norms of kinship are more familiar and perhaps stronger than the reputational threat of being ostracized from one’s friendship or colleague network, but the essential similarity is the difference in governance within versus beyond. The virtue to tight integration of the hypotheses is that closed networks are a phenomenon more general than family. Most people have a family, but there are in addition closed colleague networks and closed social networks

beyond the family. If distrust and lack of cooperation are a function of closed networks, then distrust and a lack of cooperation is to be expected much more broadly than expected from the family-trust hypothesis. Distrust is to be expected from people deeply embedded in any kind of closed network. There is also a modification to the family-trust hypothesis: Families that are less closed as a network should generate less distrust of outsiders.

Loose integration would be to understand that kinship norms within a family provide a form of network governance that is stronger and more absorbing than typically exists by reputation cost within colleague networks or social networks beyond the family. The family and closed-network lines of work are related such that each can benefit from advances in the other, but they are essentially separate lines of work. The expectation here would be that the association between distrust and a lack of cooperation from people deeply embedded in family is weaker and less consistent for closed networks not anchored in family.

My purpose in this note is to do some preliminary work to inform a preference for tight or loose integration. If you want conclusions without the details, jump to the concluding section on pages 15-16. The flow from here is that I sketch evidence for the two arguments, then re-consider family ties in the data Sonja and I used in our *Organization Science* article, then look at General Social Survey network data to assess overlap between family ties and closed networks in a general population. There is considerable overlap at the same time that there is substantial contradiction. An interesting horse race waits to be run between the two hypotheses.

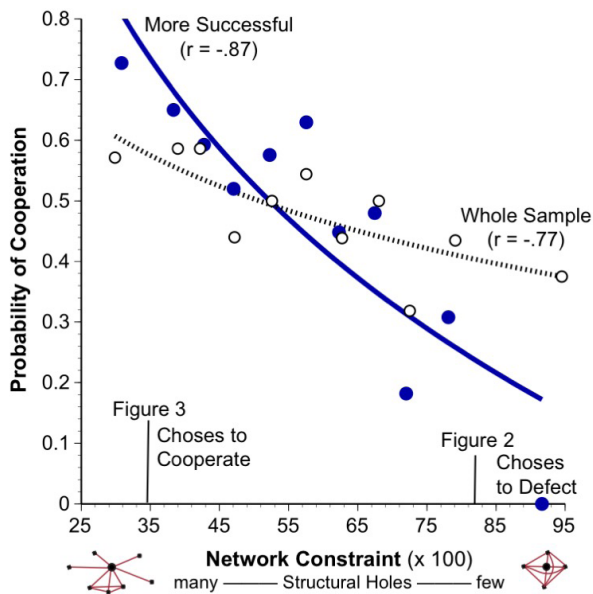
Evidence on the Closure-Cooperation Hypothesis

Figure 1A displays core results in Burt et al. (2021: Fig 1). The data come from a large area probability sample of Chinese CEOs running small to medium size private companies. Network closure is measured on the horizontal axis by the network constraint index (Burt, 1992:Chp. 2). Measuring the extent to which the network around a person (ego) constrains ego's opinion and behavior, constraint decreases with network size (more contacts in a network mean more freedom of choice for ego), increases with network density (stronger connections between contacts limit ego's freedom of choice), and increases with centralization/hierarchy (a dominant contact in the network limits ego's freedom of choice). Small, dense networks are to the right in Figure 1A (network poses high constraint). Large, open networks are to the left (network poses low constraint, i.e., network brokers).

The vertical axis in Figure 1A is the probability that a respondent cooperates in a one-shot game of Prisoner's Dilemma with an unknown Chinese CEO similar to the respondent. The downward sloping lines in Figure 1A show the expected effect: the more closed the network around a respondent, the less likely he or she cooperates with the unknown peer outside the network (dashed line). The association is particularly strong for CEO's leading profitable businesses (solid line). If you've managed to rise above the odds to be successful with a closed network, you are all the more smugly comfortable staying away from people beyond the network.

Figure 1. Evidence.

A. Cooperation and Social Network



NOTE – Plotted data are averages for 5-point intervals on X with thin tails of X truncated for infrequency. Displayed correlations are computed from the plotted data. “More Successful” are CEOs whose businesses had above-median profit last year. Adapted from Burt et al. (2021: Figure 1).

B. Cooperation and Network History

	Events Go Back	Coefficient for CEOs of Successful Businesses
Only Current Contacts	0.0 years	-.71 (-0.99)
Plus Event-5 Contacts	1.6 years	-1.15 (-1.40)
Plus Event-4 Contacts	3.6 years	-1.57 (-2.01) *
Plus Event-3 Contacts	5.8 years	-2.14 (-2.79) **
Plus Event-2 Contacts	8.2 years	-1.79 (-2.74) **
Plus Event-1 Contacts	10.7 years	-1.90 (-3.00) **
Plus Founding Contacts (whole network)	11.8 years	-2.24 (-3.31) ***

NOTE – Each row contains logit coefficient and test statistic for the slope of the solid line in the graph. Networks in the top row include only current contacts. Networks in the bottom row include all current and all event contacts (which are the networks used for the graph). “Events Go Back” is the average number of years ago that the oldest included event occurred. All controls in the analysis are held constant here. Adapted from Burt et al. (2021:Table 6).

* P ≤ .05 ** P ≤ .01 *** P ≤ .001

The results in Figure 1A require quality network data. Routine practice in a survey is to identify a network set of people connected to a respondent by some criterion kind of relationship defined by a “name-generator” question, then flesh out the network with “name-interpreter” questions about characteristics of the cited people, and relations with and among the cited people (e.g., how long known, how often met, how close to, family, same organization, etc.). Marsden (2011) is an oft-cited discussion of generators and interpreters (see also Perry, Pescosolido & Borgatti, 2018: 345). Specific name generators often used to capture the network around managers are: **buy-in** (e.g., “Who are the most essential sources of support, buy-in, for success in your job?”), **advice** (e.g., “Who are the people to whom you turn for advice on work-related matters?”), or **work contact** more generally (e.g., “Who are the people with whom you most often discuss your work?”, or “Who are the people with whom you have had the most frequent and substantive work contact?”). The General Social Survey (**GSS**) name generator is often used to capture the core social network around people in a general population: “Who are the people with whom you most often discuss matters important to you?” See Burt (1984) for initial argument, Marsden (1987) for substantive discussion, and Small (2017: Appendices) for reflective methodological discussion.

It is important in the data collection that the respondent is free to name anyone in response to a name generator, whereupon closure around the respondent is indicated by few people named, and strong connections between the people named.

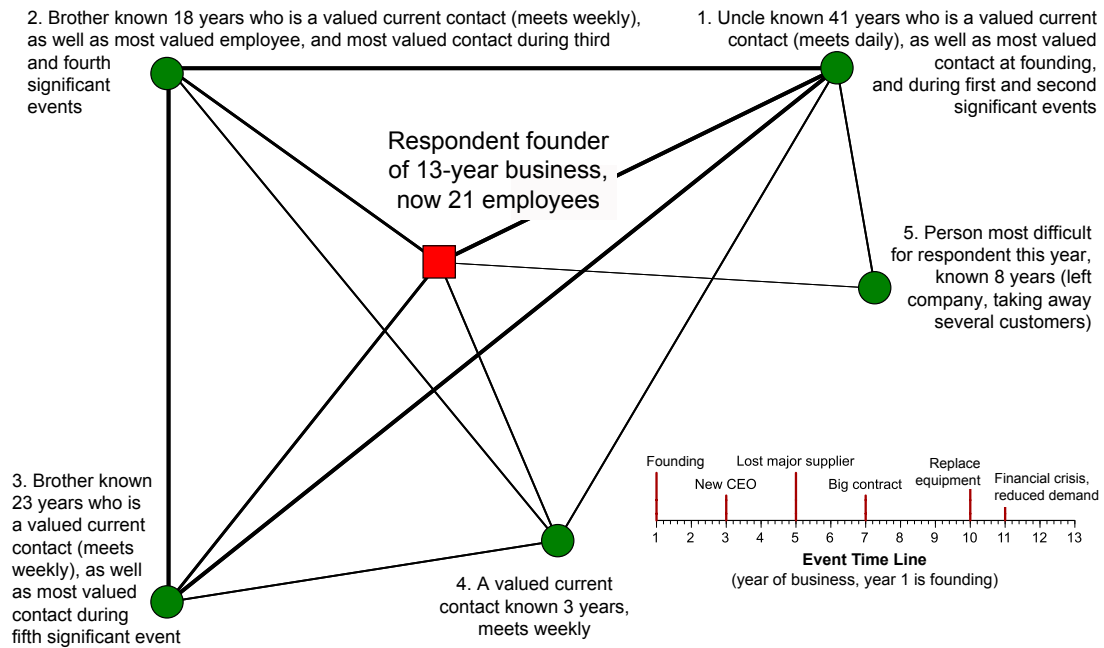


Figure 2. Relatively Closed CEO Network
(81.2 network constraint)

To connect the Figure 1A results to concrete network images, Figure 2 displays a closed network, and Figure 3 displays an open network. Line thickness indicates closeness. No line is a “distant” relation. In three ways, the network in Figure 2 is more closed than the one in Figure 3 (these are Figures 2, 3 in Burt et al., 2021): First, the network in Figure 2 is smaller with stronger connections between the CEO’s contacts (5 contacts with 47.3 density, versus 10 contacts in Figure 3 with 26.6 density). Network constraint on the CEO in Figure 2 is accordingly high at 81.2 points (1.74 z-score, noted on horizontal axis in Figure 1A). Network constraint on the CEO in Figure 3 is relatively low at 34.7 points (-1.56 z-score).

Second, Figure 2 is more composed of family, which adds its own kind of closure to the structure (60% family in Figure 2 versus 0% in Figure 3).

Third, the CEO in Figure 2 makes repeated use of the same people for support. He went to his uncle for help in founding the business, then returned when a new CEO was needed, and again when a major supplier was lost (significant events one and two to the lower-right in the figure). He went to his brother of 18 years for help with a large contract, and when he made a large capital investment in equipment (events three and four). The financial crisis rolled over China just after the CEO in Figure 2 invested in new equipment. Company sales were hard hit. He went to his other brother for help in dealing with that event. In short, the Figure 2 CEO returns to his family again and again for help. In contrast, no contacts in Figure 3 are cited for more than one significant event, and most of the contacts cited as valued during events are met currently, but are not named as most valued current contacts (green dots).

Given the more closed network in Figure 2, the closure-cooperation hypothesis predicts that the CEO in Figure 2 is less likely to cooperate with unknown people

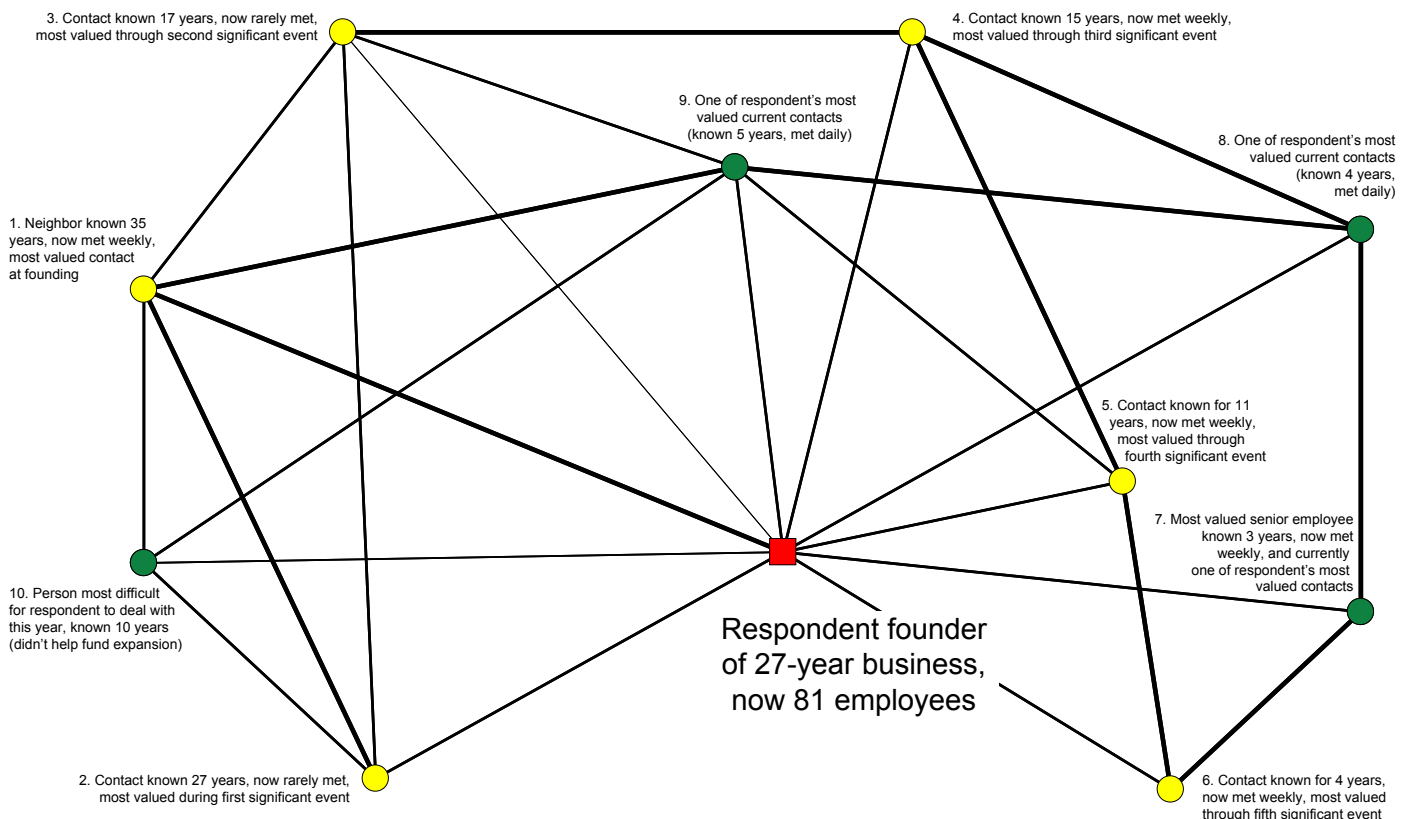


Figure 3. Relatively Open CEO Network
(34.7 network constraint)

beyond his network. As predicted, he defects against his opponent in the Prisoner's Dilemma game. Also as predicted, the respondent in Figure 3 with the relatively open network cooperates in the game.

A final note: Sonja and I wanted to show that the associations in Figure 1A were the result of behavioral patterns established over time — i.e., that the network behavior pre-existed the survey moment at which the respondent chose between cooperation or defection. We traced a respondent's network back in time. Some of the contacts cited by respondents were important contacts in current business. Many were met daily (53%), but a sizable number were met less than monthly (14%). What they had in common was that they were important for the respondent's business this year. Other contacts were cited for helping the respondent deal with significant events that had come up during the history of building the business. Call the latter contacts "event contacts." Event contacts are often people the respondent meets frequently (63% are met daily), but they are not among the people cited as most important for business this year.

We built a sequence of networks around each respondent, beginning with current contacts, then adding event contacts one at a time, recomputing network constraint at each iteration. The result was seven networks around each respondent. The first was a network composed only of contacts cited on name generators eliciting current contacts. The second was the current contacts plus the contact cited as particularly valuable in helping the respondent with the most recent event. The most-recent prior event contact was then added to the network, and so on until we reached the whole network composed of a respondent's current contacts plus all of his or her recorded event contacts. The results in Figure 1A are based on the whole network.

The table in Figure 1B shows how the “network effect” on cooperation during the survey becomes stronger as the network around a person is extended further back in time. There is no association with the network of people named as important contacts this year (-.99 test statistic, $P \sim .32$). The association is statistically significant when the network is extended back more than two years (-2.01 test statistic), and more clearly significant after five years (test statistics of -2.79 to -3.31).

Evidence on the Family-Trust Hypothesis

This hypothesis is widely known as a component in discussions of civic participation. The family-trust hypothesis describes family networks (strong relations and duty concentrated within the family) decreasing trust in people outside the family, which leads to low civic participation to improve the community. Banfield (1958) is the taproot study. In the mid-1950s, he moved with his family for nine months into a village at the southern end of the Italian peninsula to understand barriers to development, and settled on what he termed “amoral familism.” As Banfield (1958:9-10) summarizes: “The book is about a single village in southern Italy, the extreme poverty and backwardness of which is to be explained largely (but not entirely) by the inability of the villagers to act together for their common good or, indeed, for any end transcending the immediate, material interest of the nuclear family.” In several ways unintentionally replicating Banfield’s study, Gans (1962) comes to a similar conclusion based on his seven months in the Italian neighborhood of Boston’s West End. Focusing on one’s own family-based group to the exclusion of others (termed “peer groups” by Gans) limited coordinated resistance to the urban renewal program that destroyed the Italian neighborhood (which is the point taken up by Granovetter, 1973). Putnam (1993:88) makes use of the amoral familism imagery to explain low civic participation in south Italy relative to the north: “The absence of civic virtue is exemplified in the ‘amoral familism’ that Edward Banfield reported as the dominant ethos in Montegrano, a small town not far from our Pietrapertosa: ‘Maximize the material, short-run advantage of the nuclear family; assume that all others will do likewise.’” Gambetta (1988: Chp. 10; 1993) takes the imagery a step further in asking how people protect their personal property in the context of what Banfield described as amoral familism. The answer is the rise of family groups specializing in the business of selling protection not available from civic authority, i.e., the Sicilian Mafia. To be sure, distrust beyond one’s own family is not the whole story (Gambetta, 1993:77ff.), but Banfield’s amoral familism is the soil from which the Mafia springs.

It is no simple matter to move from the above observational and archival evidence of a family-trust hypothesis down to generalizable evidence on individuals. For example, Herreros (2015) uses World Value Survey data from 57,675 respondents in 44 countries to test for the negative association between family and trust beyond the family. Trust is measured by a respondent’s binary response to the question “Generally speaking, would you say that most people can be trusted or that you need to be very careful when dealing with people?” The extent to which a respondent is deeply embedded in his or her family network is measured by the respondent’s number of children, and a four-point opinion on the importance of family (brackets inserted, “For each of the following, indicate how important it is in your life. Would you say [family] is: Very important; rather important; not very important; not at

all important?”). Number of children washes out of the analysis, but opinion on importance of family has a strong negative association with expressed trust in people (Herrerros, 2015:348). The association is intriguing in that it is strong in the expected direction, the data are voluminous across multiple countries, and respondent country and education are held constant, which means the family-trust association is not peculiar to Italians, or people with little education. Intriguing yes, but the data are shockingly thin relative to the earlier work; four-level opinion on importance of family predicting a yes-no opinion on whether people in general can be trusted.

Alesina and Giuliano (2011) take a broader look at multiple earlier waves of the World Value Survey. Across more than one hundred thousand respondents in multiple countries — controlling for country, year, education, marital status, religion, and income — Alesina and Giuliano’s “family ties” variable has a strong negative association with the trust measure used by Herreros, and strong negative associations with various indicators of civic participation (Alesina and Giuliano, 2011:826-827). Their “family ties” variable is the sum (by addition or principal component) of three opinion items: (1) the four-point importance of family item in Herreros’ analysis (1 for very important, up to 4 for not at all important), (2) forced choice between the following two statements (1 for “Regardless of what the qualities and faults of one’s parents are, one must always love and respect them;” and 2 for “One does not have the duty to respect and love parents who have not earned it.”), and (3) forced choice between the following two statements (1 for “It is the parents’ duty to do their best for their children even at the expense of their own well-being;” and 2 for “Parents have a life of their own and should not be asked to sacrifice their own well-being for the sake of their children.”). An additive score of three across the items indicates a person deeply embedded in their family network. A score of eight indicates a person minimally tied to their family.

Alesina and Giuliano offer a thorough analysis with broader data, and innovative use of immigrant average family scores in country of origin (Alesina and Giuliano, 2011:828-832), but there is only so much that one can do with opinion data. Thus, Ermisch and Gambetta’s (2010) evidence on the family-trust hypothesis is particularly welcome. They combine the generalizability of a population survey with the validity of behavior in a variation of the standard trust game (Berg, Dickhaut & McCabe, 1995). Stated opinions about trust can have correlates very different from correlates of trusting behavior (e.g., Bellemare and Kroger, 2007:195-196, on the “quite remarkable” differences between correlates of the World Value Survey trust item used above by Alesina, Giuliano, and Herreros versus correlates of behavior in a trust game). For a subset of 170 respondents from the probability sample interviewed for the British Household Panel Survey, Ermisch and Gambetta (2010: 367-369) measure trusting behavior with their variation on a widely-used trust game: A survey respondent (ego) receives £10, and is then given the option of increasing the £10 to £22 by giving the £10 to another respondent in the survey (alter) with whom ego has been randomly matched. Ego is told that alter will be given £40 with an explanation of ego’s decision, whereupon alter will be asked whether he wants to keep all £40, or split the money with ego, returning £22 to ego, and keeping £18 for himself. Neither ego nor alter receive any information about the other, except their joint participation in the survey. If ego keeps the £10, the game ends and ego

is coded as not trusting alter. If ego sends the £10, the game plays out, and ego is coded as trusting alter.

To measure family ties, Ermisch and Gambetta (2007:370-371) rely on data available in the survey. They create a binary family predictor that equals one for respondents who see daily or once a week a family member living in a different household, and zero for respondents whose most frequent contact is less than weekly. Also, persons without a living adult child, father, or mother living elsewhere are coded as zero. As expected, respondents high on the family ties are less likely to trust (Ermisch and Gambetta, 2007:371): Of respondents low on family ties, 50% send the £10. Of respondents high on family ties, 34% send the £10.*

The most authoritative data to date come from a national probability survey of trust and family ties in Italy (Aassve, Conzo, & Mattioli, 2021). Extending Bigoni et al.'s (2016) cluster sampling of game play in four Italian cities to contrast play in the north with play in the south, Aassve et al. have respondents in a national probability sample play a standard trust game, as well as other games related to trust and cooperation. Strength of family ties is measured from opinion items as a continuous variable following Alesina and Giuliano (described above). Aassve et al. are primarily concerned with differences between respondents in the north and south of Italy. Family ties are discussed briefly in the published article (section 7.3), but the results most relevant to this note are in Table A21 of the supplemental materials predicting trustworthiness (defined in Section 3.1 of Aassve et al., with corroborating results in Table A22 predicting respondent's contribution to public goods relative to peers, "reciprocity" in footnote 9 of Aassve et al.).

For three reasons, it is difficult to say that family ties predict trust in the Aassve et al. data: First, the family ties variable is not included in prediction tables except in the supplemental materials, and it is never used to predict trust, just the related game behavior variables measuring trustworthiness (Table A21) and reciprocity (Table A22). If family ties were a strong predictor, I assume it would have been included with the many other predictors used. The absence of family ties as a predictor is not a problem since the analysis is about regional differences. I merely assume

*Side-note in the spirit of coverage: Ermisch and Gambetta do not build from Banfield or Gans. They ground their family-trust study in Yamagishi and Yamagishi's (1994) explanation for why Japanese people are less trusting of strangers than are Americans. The rhetoric in Yamagishi and Yamagishi comes at times tantalizingly close to the rhetoric of the closure-cooperation argument (e.g., page 137): "Although the profit expected from a deal with an 'outsider' may be greater than the profit assured in a deal with an 'insider,' the deal with an outsider involves a risk of being exploited. Perception of this risk or the subjective social uncertainty may be higher among those who mostly deal with insiders in committed relations than those who are regularly in contact with outsiders. In this sense, commitment may actually reduce the level of trust in outsiders..." Yamagishi and Yamagishi's argument, however, is anchored at the level of dyads, committed versus not. Trust opinions of Japanese (as people who live in committed relations and are therefore reluctant to trust outsiders) are compared to trust opinions of Americans (as people not limited to committed relations and therefore less reluctant to trust outsiders). There is a mean difference, but also substantial variation within country. I expect that Japanese or Americans in more closed networks are more reluctant to trust outsiders than are Japanese or Americans in more open networks. Of course, there could be a country difference above and beyond the network effect on individuals, but whatever country difference remains after individual networks are held constant I suspect would be due to a higher level of closure around the average person in the less trusting country.

its absence indicates that the authors did not find family ties an important control variable in their predictions of trust and cooperation.

Second, little association is revealed when the family ties variable is included as a predictor. Trustworthiness has a negative, but statistically negligible, association with family ties (test statistics of 1.95 and 1.77 in Table A21). Reciprocity has a slightly stronger negative association with family ties (test statistics of 1.97 and 1.99 in Table A22). In fairness, both tables include a regional dummy, South, that distinguishes respondents in southern regions, where family ties are stronger (Aassve et al., 2021: Figure A9, Table A20). Some of the statistically significant tendency for respondents in the south to be less trustworthy (test statistics of 2.06 and 2.05 in Table A21), would be attributed to a negative effect from family ties if the South variable were removed from the prediction.

Third, the two tables that contain family ties as a predictor also contain a block of game behavior variables strongly correlated with one another and the dependent variable. It is difficult to know how much of any negative association with family ties in the two tables is affected by multicollinearity. For example, trust in the trust game has 5.11 and 6.10 test statistics in predicting trustworthiness in the trust game (Table A21). Such strong association can obscure evidence of the weaker associations with family ties. Again, no problem here for an analysis of regional differences, but it is difficult to interpret trust/cooperation associations with family ties. A simple graph of trust game behavior across levels of the family ties predictor would be welcome.

In sum, evidence for the family-trust hypothesis exists in two worlds. There is thick observation and archival evidence with limited generalizability illustrated by Banfield (1958) and Gans (1962). There is thin survey evidence that generalizes clearly, but at terrible cost to the substance of what it means to be deeply embedded in a family network. To be sure, the behavioral evidence on trust illustrated in Ermisch and Gambetta (2010) and Aassve et al. (2021) inspires more confidence than the opinion data on trust illustrated in the analyses by Alesina and Giuliano (2011) and Herreros (2015) — and both kinds of evidence have supported a negative association between family ties and trust beyond the family. However, one suspects substantial measurement error in the family predictor, which has implications for unknown bias in estimated effects (e.g., https://en.wikipedia.org/wiki/Errors-in-variables_models). Nor is thin description of the family predictor to be proposed as necessary because the generalizability of survey evidence requires thin measurement. Network data could be gathered in a venture as grand as the World Value Survey in the same way that such data have been gathered in other large probability surveys. That endeavor has yet to occur.

Evidence on Family Ties and Network Closure

To form a preference between tight versus loose integration of the family-trust versus closure-cooperation hypotheses, I return to the data in Figure 1 to ask how family overlaps with the contact network around each respondent, and how variation in overlap affects the network prediction of cooperation.

Table 1 shows how cooperation varies with business contacts drawn from family. For example, three of the contacts named by the CEO in Figure 2 are members of the CEO's family (two brothers and an uncle). Table 1 shows that family is usually not a source of business contacts: 334 of the 500

Table 1. Cooperation and Number Family Contacts

Family Named as a Business Contact	Defect	Cooperate	Total
None	170 (51%)	164 (49%)	334 (100%)
One	66 (52%)	61 (48%)	127 (100%)
Two or more	17 (44%)	22 (56%)	39 (100%)

respondent CEOs named no relative as a business contact (67%). The observation is largely irrelevant here because there is no association between family and cooperation. Number of family members named as business contacts is independent of cooperation (0.87 chi-square, 2 d.f., $P \sim .65$).

Turning to family for help with the business is a measure of family ties, but it need not indicate a person operating under family social norms. A more direct measure is to distinguish CEOs who run a business owned by his or her family, and in which one or more other family members are employees. That traditional criterion for distinguishing "family businesses" is foundation in Burt, Oppen, and Zou (2021) for distinguishing three kinds of businesses in the sample: Family firms, firms that exclude family, and hybrid family firms that exclude family but behave like family firms. The paper explains the distinctions. It is enough for the purposes here to rely on meaning implied by the three category labels. Table 2 shows that CEOs running family firms or hybrid family firms are more likely to cite family members as business contacts ($< .001$ probability of no differences), but there are no differences in terms of the network constraint that predicts cooperation (.15 probability). Nor do the heads of family firms stand apart for a lack of cooperation beyond their network (.62 probability).

My conclusion is that network closure is not associated with businesses embedded in families (e.g., the closed network in Figure 2 and the open network in Figure 3 are both around CEOs running family businesses), and being embedded in family (in terms of family being a source of business contacts, or running a business embedded in family) has no association with cooperation. Regardless of family present in these networks, closure decreases the odds of cooperation with people beyond the network.

With respect to the two hypotheses, the family-trust hypothesis is not wrong so much as it is irrelevant. I suspect that personal identity in the sense of "Who am I?" for these entrepreneurial people is based on their business network more than it is based on their family. My working hypothesis at this point is that the family-trust hypothesis is a special case of the more general closure-cooperation hypothesis.

Table 2. Correlates of Family Versus Other Firms

Kind of Firm	Percent Family	Network Constraint	Percent Cooperate
Family	11.2	57.0	47.2
Hybrid Family	16.4	56.3	47.6
Family-Excluded	0.4	54.5	51.7
P(no difference)	< .001	.15	.62

NOTE — Row distinctions between 500 sample businesses are from Burt, Opper, and Zou (2021). Percent family are the percent of key business contacts who are family to the CEO respondent. Network constraint is the horizontal axis in Figure 1 that predicts cooperation. Percent cooperate is the percent of row respondents who cooperate in a Prisoner's Dilemma game with an unknown CEO of some other Chinese private firm (vertical axis in Figure 1). Probability of no difference is based on $F_{(2,497)}$ statistics for percent family and constraint, chi-square statistic with 2 d.f., for cooperation.

I cannot go so far as to say that the above authors working with opinion data on family would have found support for the closure-cooperation hypothesis if they had survey network data. Their data come from general populations. Some proportion of people in those populations must identify more with family than with their work. Still, if the authors had survey network data, it is possible they would have found that network closure dominates family ties in predicting trust.

A key question for the feasibility of that speculation is how often closure in a general population is due to family. The stronger the correlation between family ties and closed networks, the more often empirical support for the family-trust hypothesis could equally well be support for the closure-cooperation hypothesis.

The weaker the correlation between family ties and closed networks, the more opportunities there are to distinguish the hypotheses. The closure-cooperation hypothesis would win support from cases in which low trust occurs with weak family ties in closed networks, plus cases in which high trust occurs with strong family ties in open networks. The family-trust hypothesis would win support from cases in which low trust occurs with strong family ties in open networks, plus cases in which high trust occurs with weak family ties in closed networks.

I took a quick look at the General Social Survey (GSS) network data to get a sense of overlap between family ties and closed networks in a general population. Putting aside experiments and data complications in some years of GSS network data (Paik and Sanchagrin, 2013), I went back to the original 1985 GSS. That year did not include the general trust item usually in the survey (perhaps a victim of making room for the network items), but the 1985 network data have been thoroughly studied.

Family and network size/density (components in network closure) are central in Marsden's (1987) summary report on the networks. Of people named for discussing "important matters," half are family for the average respondent, but the balance between family and discussion partners outside the family differs widely between

networks (Marsden, 1987:126): “30 percent consist only of persons having some family relation to the respondent, while nearly 20 percent contain no family members.” Not surprisingly, the balance of family to nonkin discussion partners shifts away from family for respondents with more education, living in larger cities (Marsden, 1987:127). *A first point about people in the general population is that there is substantial overlap between family ties and ties outside the family on average, with networks at both extremes of only family and only ties beyond the family.*

The association with age is complicated by the mix of parents, children, and other family in the networks of respondents at different ages. Marsden (1987:127-128) reports a curvilinear association on average — with middle-age respondents naming the highest proportion family among their discussion partners. Figure 4 on the next page shows network composition by respondent age (from Burt, 1991: 11). Overall, network size decreases with age and there is a shift from parents to children for respondents in their 40s.

To the extent that family ties increase distrust in outsiders, age is for two reasons a covariate important to understanding the mechanism by which the effect happens. First, because family discussion partners are constant in number, and therefore are an increasing proportion of the decreasing number of discussion partners. Second, because of composition. Family ties are with parents and siblings for respondents in their 20s and 30s. Family ties are with siblings and children for respondents in their 50s and 60s. How do parents, siblings, and children differ in animating a reluctance to trust beyond the family? *A second point about people in the general population is that the network around a person becomes more closed with age (smaller and more dense from more concentration in family), which both hypotheses predict will result in less trust in outsiders, but the nature of family changes with age such that the strength of the family-trust hypothesis could change with age.*

Combining relatives into one category called “family,” Table 3 on page 15 shows how network closure changes with increasing proportion family in a discussion network. Across the columns, closure is measured by network density — the average strength of connection between people cited as discussion partners. A score of 1.00 indicates a network in which every person named is “especially close” to every other person named. A score of 0.00 indicates a network in which every person named is a “total stranger” to every other person named. Rows distinguish respondents by the proportion of their discussion partners who are family. The first row, “No family,” contains respondents who named no family. The bottom row, “All family,” contains respondents who only named family.

I take two points from Table 3. First, closure increases with family ties. Density has a positive association with family (.33 regression coefficient predicting density from proportion family, 15.52 t-test, $P < .001$), and an increasing slope as family dominates a network. Looking down the median column in Table 3, for example, average density is .50 for the first three rows, then increases to .67 when family comprises more than half the discussion partners, and increases to maximum connectivity, 1.00 in the bottom row, when the network is composed only of family.

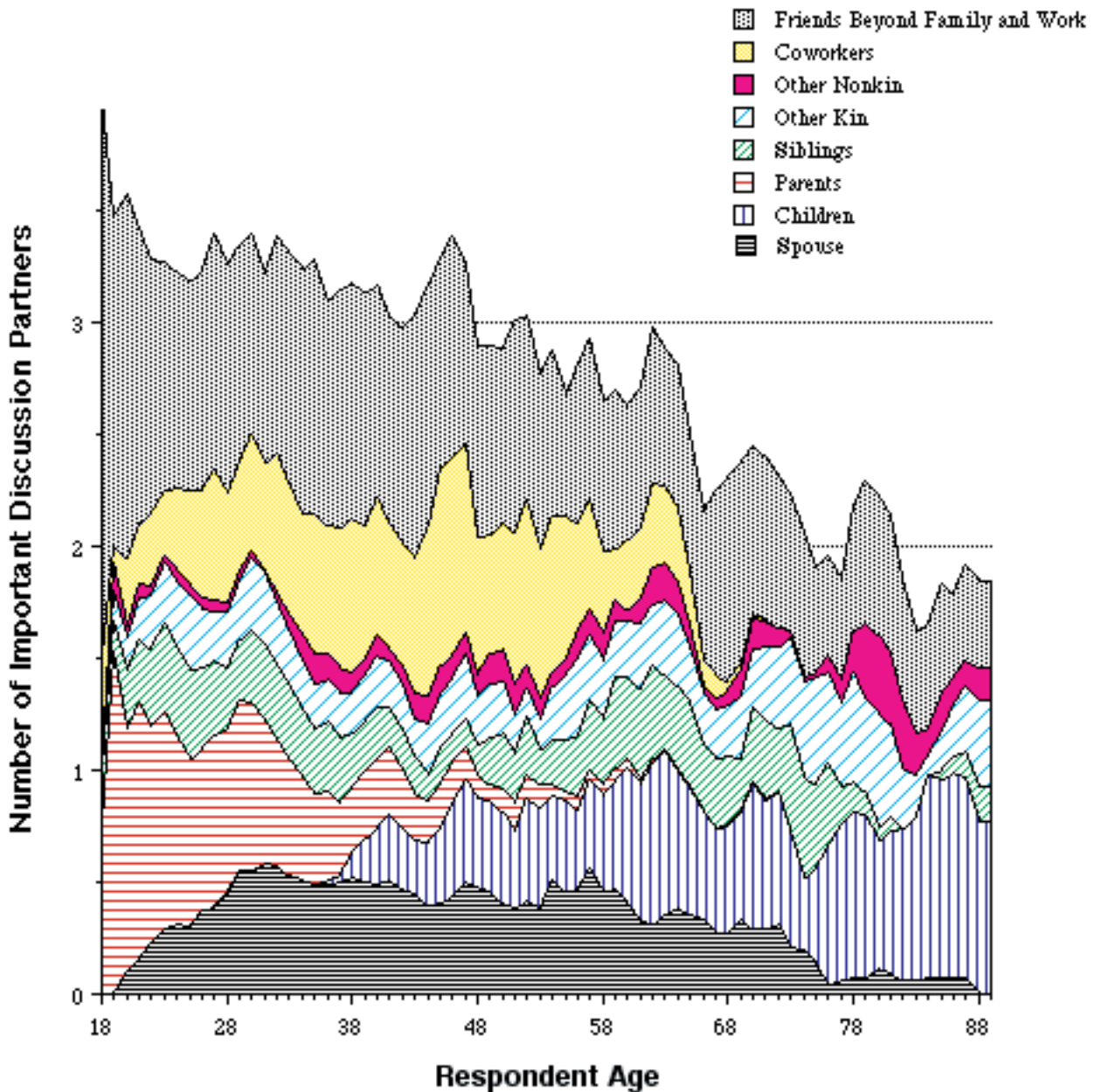


Figure 4. GSS Network Composition by Respondent Age

Second, there is substantial variation away from the average association. Even at the extreme of a network only composed of family, there are some networks in which density is zero - no family member is connected with any other. The more substantial deviation is in the networks that contain no family (first row). There are a great many closed networks that contain no family (75th percentile in density is .83 in the first row, which is the second highest level in that column). These are prime sites to test the two hypotheses against one another. The family-trust hypothesis predicts that people in the first row are likely to trust people beyond the family. The closure-cooperation hypothesis says that the ones in more closed networks will defect against people beyond the network. More generally, there are at every level of family presence in a network, some networks that are completely closed (maximum column is 1.00 in each row) and some that are completely open (minimum column is .00 in each row). *A third point about people in the general population is that there are many*

Table 3. GSS Network Density by Proportion Family

Proportion Family	N	Minimum	25 th Percentile	Median	75 th Percentile	Maximum
No Family	205	.00	.33	.50	.83	1.00
Less than half	302	.00	.33	.50	.60	1.00
Half Family	129	.00	.42	.50	.58	1.00
More than half	275	.00	.50	.67	.75	1.00
All family	256	.00	.67	1.00	1.00	1.00
Total	1,167	.00	.45	.58	.83	1.00

NOTE — These results are based on the 1,167 respondents who named two or more people with whom they discuss important matters. Density is average strength of connection between cited people (1 for especially close, 0 for total strangers, .5 for something in between).

with closed networks devoid of family, and some with open networks composed primarily of family. These networks in which family is not associated with closure are opportunities to assess the two hypotheses against one another.

Conclusions

This note was provoked by my inattention to work on a trust-family hypothesis when Sonja and I wrote our paper on the closure-cooperation hypothesis. The latter says that closure in the network around a person is negatively associated with cooperation toward people beyond the network. There is strong evidence of the hypothesis from network and behavior data on an area probability sample of Chinese CEOs in small and medium size private businesses (Figure 1). The overlooked family-trust hypothesis says that strong family ties inhibit trust in people outside the family. There is observational and archival evidence to support the hypothesis, much of it on people in the south of Italy (Banfield, 1958, is a taproot study), and opinion survey evidence from national probability samples (e.g., Alesina & Giuliano, 2011). The early evidence on which a family-trust hypothesis was proposed is richer in detail than the evidence on the closure-cooperation hypothesis, but also less precise and less representative than the network and behavioral data supporting closure-cooperation. The survey evidence advanced in support of the family-trust hypothesis is attractively representative of general populations. Relative to the network and behavioral data supporting the closure-cooperation hypothesis, however, the opinion survey evidence for family-trust is thin in capturing family ties and trust (noting the exception of behavioral trust data in the surveys by Ermisch & Gambetta, 2010; Aassve et al., 2021).

The two hypotheses are conceptually similar, but substantively distinct, so it is not obvious how to integrate them. Tight integration casts the family-trust hypothesis as

an example of the closure-cooperation hypothesis. Family is merely a kind of closed network. Loose integration casts the family-trust hypothesis as a distinguishable extreme case of the closure-cooperation hypothesis. The qualities to network closure that are responsible for poor cooperation with outsiders are so amplified in a family network that families need to be kept distinct as a special case of closure. A field is set for deciding between tight or loose integration of the two hypotheses.

Preliminary exploration here leads me to prefer tight integration in the short run, and anticipate productive work assessing the two hypotheses against one another. Re-analysis of the evidence in Figure 1 supporting the closure-cooperation hypothesis shows no effect of family ties on behavioral cooperation (Tables 1 and 2). Network closure has its effect regardless of family. There is evidence of a gender effect in the published report (Burt et al., Forthcoming: Table 5) that can be interpreted as evidence of gender homophily affecting cooperation in China, as it does in the West (e.g., Abrahao, Parigi, Gupta & Cook, 2017, on trust; McPherson, Smith-Lovin & Cook, 2001, more generally). Homophily factors promise to be useful in testing closure against family. Finally, a quick look at the 1985 GSS network data in Figure 4 shows that network closure and family ties overlap substantially, but also often contradict one another. (1) There is substantial overlap between family ties and ties outside the family on average, with networks at the extremes of some only containing family and some containing no family. (2) The network around a person becomes more closed with age (smaller and more dense from more concentration in family), which both hypotheses predict will result in less trust in outsiders, but the nature of family changes with age such that the strength of the family-trust hypothesis could change with age. (3) Network closure and family ties overlap substantially, but there are numerous people with closed networks devoid of family, and some people with open networks composed primarily of family. These networks in which family is not associated with closure are opportunities to compare the two hypotheses for their predictions.

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