

Temporal Dynamics of Social Exchange and the Development of Solidarity: “Testing the Waters” vs. “Taking a Leap of Faith”

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January 12, 2011

Approximately 9437 words

*This research was supported by Columbia Business School. I thank xxx for helpful comments on earlier drafts.

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This article has been accepted for publication in *Social Forces*.

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ABSTRACT

Contemporary exchange theorists have made concerted efforts to unpack the micro-processes that transform repeated exchanges into an exchange *relation*. We extend this line of work to study how temporal dynamics of exchange affect the development of solidarity. Some exchange relations develop gradually over time as actors “test the water” and manage the risks and uncertainties of exchange (*incremental exchange*). Other relations get off to a quick start as actors take “leaps of faith” in each other (*constant exchange*). Do these patterns result in different levels of relational bonding? We examined this question in three laboratory studies designed to manipulate two dimensions of repeated exchange: exchange *level* (how much actors exchange) and *frequency* (how often actors exchange). In each study, participants played a series of social exchange tasks involving sending and returning benefits or resources to anonymous partners in dyads. The results show that exchanging incrementally in exchange level promotes cohesion, but exchanging incrementally in frequency undermines it. These results affirm the importance of exchange frequency but demonstrate an opposite effect for exchange level: compared to exchanging constantly, exchanging incrementally in exchange level creates more expressive value to reinforce cohesion, even while resulting in less instrumental benefits.

While people ostensibly enter exchange relations for instrumental benefits, they stay in particular exchange relationships in part because of the *expressive value* of repeated exchanges (Blau 1964; Emerson 1976; Homans 1958; Lawler 2001; Molm, Schaefer, and Collett 2007b). Trust, regard, and cohesion are emergent properties of exchanges that actors develop toward one another as well as the relationship itself through repeated interactions. Together, they are intangible benefits of exchange that create symbolic or expressive value inasmuch as actors come to attach social and relational significance to the acts of exchange themselves and value the relationship above and beyond its instrumental outcomes.

Over the past two decades, contemporary exchange theorists have made significant advances toward unpacking the endogenous micro-processes that transform repeated exchanges into committed *relations* under different conditions varying in relational power-balance (Lawler, Thye, and Yoon 2000; Lawler and Yoon 1993), exchange tasks (Molm, Collett, and Schaefer 2007a; Schaefer 2009), and exchange uncertainty (Kollock 1994; Yamagishi, Cook, and Watabe 1998; Kuwabara, Willer, Macy, Mashima, Terai, and Yamagishi 2008). Taken together, this body of work has become one of the most fruitful and cumulative lines of research in micro sociology (e.g. Molm 2010; Lawler, Thye, and Yoon 2009).

At the same time, however, theories of exchange have focused primarily on static or aggregate properties of repeated exchange and paid far less attention thus far to how exchange relations evolve over time. The present research seeks to fill this gap by examining how the *temporal dynamics* or patterns of exchange affect the development of cohesion in dyadic exchange relations. Many relations develop gradually as actors “test the waters,” hedging against the risks and uncertainties inherent in social exchange while committing incrementally by slowly

learning about each other (“incremental” exchange). Other relations get off to a head start as actors “hit it off” or take “leaps of faith” in each other, quickly settling into high-stakes interactions (“constant” exchange). Do these exchange patterns result in different levels of solidarity? If so, which is more likely to build stronger relations, and why? Is it wise to hedge in the beginning of new relationships? Answers to such questions have both practical and theoretical implications for advancing our understanding of how repeated interactions become cohesive relations.

In the present research, we develop an attribution model of exchange dynamics to specify how the temporal pattern of exchange conditions the attributions actors make about each other and the exchange relation. Research on exchange relations has identified attribution as a key process in the development of solidarity (e.g. Kramer and Lewicki 2010; Lawler 2001; Malhotra and Murnighan 2002; Molm, Collett, and Schaefer 2006; Weber, Malhotra, and Murnighan 2005). For instance, Lawler’s (2001) affective theory of exchange posits that bonds of solidarity form when emotions produced from interactions are attributed to different social targets—the self, the partner, the relationship, or the external situation. Actors develop feelings of cohesion—a sense of “we-ness”—in particular when they attribute positive emotions to the relationship rather than to other units of exchange.

Our model of exchange dynamics specifies how and when temporal patterns in exchange level (how much benefit is exchanged) and frequency (how often benefits are exchanged) convey expressive value above and beyond the instrumental value of exchange to create bonds of solidarity in general and cohesion in particular. We test this model in three laboratory studies to show that incremental exchange patterns can promote or inhibit cohesion, depending on whether the exchange patterns vary in exchange level or frequency. Consistent with our predictions, we

find that exchanging incrementally in exchange level can produce more cohesion than exchanging high and constant levels of benefits (Study 1), but exchanging incrementally in frequency produces less (Study 2). In the final study (Study 3), we replicate these results to show that exchange patterns in exchange level and frequency have independent effects on cohesion, but no interaction effects. Taken together, our studies affirm the importance of exchange frequency (Lawler 2001; Molm et al. 2007b) while demonstrating an opposite effect for exchange level: exchanging incrementally in resource level creates expressive value to reinforce cohesion even while resulting in less instrumental benefits.

Despite decades of research on exchange relations in sociology, the dynamics of social exchange remain under-theorized. Network analysis has been criticized that social relations are often treated as static structures, devoid of cognitions and motivations that characterize agency (Emirbayer and Goodwin 1994). Our main goal here is to advance our understanding of how actors actively build and convey solidarity through cognitive-interpretive work to make sense of repeated interactions. In this view, exchange relations are fundamentally dynamic and social, imbued with intangible value and meanings that transform instrumental exchanges into expressive relations.

EXCHANGE THEORIES OF SOLIDARITY

Theoretical Background

Our theoretical framework builds on recent work examining how expressive value is created through repeated exchange to reinforce feelings of solidarity (Lawler 2001; Molm 2010; Molm et al. 2007b). A key notion in this line of research is that solidarity is an emergent property of repeated exchange. Each exchange produces various emotions, perceptions, and evaluations,

which actors attribute to or associate with particular units of exchange, such as each other or the relationship, to form bonds of trust or cohesion. As actors develop attachment to the relationship itself, repeated exchanges become an exchange *relation*—a cohesive social object distinct from the actors and the acts of exchange that comprise it.

The affective basis of solidarity includes trust, affective regard, and relational cohesion that enable actors to maintain mutually beneficial exchange or produce collective goods. Following Molm et al. (2007: 207), we conceptualize trust as “the belief that the exchange partner will not exploit the actor,” affective regard as “positive feelings for, and evaluations of, the partner,” and cohesion as “perception of the relationship as a social unit, with actors united in purpose and interests.” Solidarity is therefore a multi-dimensional construct, consisting of both *interpersonal* (i.e. person-to-person) and *relational* (i.e. person-to-relation) bonds (Lawler 2001; Molm et al. 2007a; Kuwabara 2010). A relationship lacks solidarity to the extent that the actors do not perceive or convey trust, affective regard, or cohesion in their interactions.

Theories of exchange identify causal attribution as a key process that mediates the development of solidarity in exchanges under risk and uncertainty (Lawler 2001; Molm et al. 2000; Malhotra and Murnighan 2002). Uncertainties about when or whether, how, and with whom occur are inherent aspects of social interactions, and reducing uncertainties by inferring what causes or predicts others’ behaviors or exchange outcomes is a fundamental human motivation for making causal attributions in interpersonal relations (Heider 1958), including exchange. For instance, extending Weiner’s (1986) attribution theory of emotions, Lawler (2001) posits that cohesion develops on the basis of positive emotions produced by repeated exchange, which actors attribute to or associate with the relationship, thereby reinforcing relational bonds. In parallel research, Molm and colleagues (Molm et al. 2006; Molm et al. 2007a; Molm,

Takahashi, and Peterson 2000) describe attributional processes involving cognitive and affective evaluations of the partner or the relationship rather than diffuse emotions. Actors develop feelings of solidarity as they attribute to each other perceptions of positive dispositions or intentions toward cooperation and mutual benefit.

A recent debate has focused on which forms or structural features of exchange are likely to invoke particular attributions to produce cohesion. For instance, in negotiated exchange, actors reach agreements—through bargaining, negotiation, or pre-specified terms of exchange—to share the benefits of exchange bilaterally. Each exchange results in both parties receiving benefits, often under binding terms. In reciprocal exchange, actors give benefits to each other unilaterally, i.e. without knowing when or whether recipients will reciprocate. On the one hand, Lawler and his colleagues (Lawler 2001; Lawler et al. 2000; Lawler, Thye, and Yoon 2008) argue that negotiated exchange entails joint action to share the benefits of exchange, contributing to feelings of “we-ness” more than unilateral, independent acts of giving from one person to another. On the other hand, Molm and her colleagues (Molm 2010; Molm 2003; Molm et al. 2007a; Molm et al. 2000) maintain that dividing resources through bargaining under binding terms of exchange can strain relationships by underscoring competitive aspects of exchange.

Exchange Dynamics

In the present research, we veer away from the focus on exchange forms to consider how the temporal dynamics of exchange affect the development of relational bonds. We compare levels of solidarity in general—and cohesion in particular—that develop in reciprocal exchange relations varying in the *level* of benefits or resources exchanged and the *frequency* of interactions

over time.¹ Exchange level increases if two people engage in exchanges of increasing value over time (e.g. from exchanging newspaper articles initially to holiday gifts to vacation invitations). Exchange frequency increases if two people exchange more and more often (e.g. from once a week to a couple of times a week to everyday).²

Exchange dynamics affect both the instrumental and expressive value of exchange. The instrumental value of exchange increases monotonically with both exchange level and frequency; the more (or more often) that partners exchange, the more instrumental value is created and transferred between them. Insofar as exchanges occur infrequently or partially in the beginning, incremental exchange therefore provides *less* instrumental value than full, constant exchange. What remains unexamined, however, is how the expressive value of exchange is created as relationships evolve from initial interactions to increasing commitment to relational stability that marks durable exchange structures. To date, exchange theory has treated both resource level and exchange frequency as aggregate measures of instrumental value, overlooking whether and how the dynamics of exchange affects expressive value. Furthermore, in past research, frequency and size were allowed to vary endogenously, confounding causal examination of their effects on the emergence of solidarity. Do people exchange more and more because of stronger bonds, or do they report greater feelings of solidarity because they exchange more and more? In the next section, we develop an attribution model of exchange dynamics based on Harold Kelley's (1967) classic work to specify how people develop bonds of solidarity towards different units of exchange as a function of different exchange patterns and predict when incremental exchange

¹ We operationalize exchange level vs. frequency in terms of continuous vs. discrete variables. Exchange level concerns how much while frequency refers to how often. Thus, duration of interaction is a resource.

² Exchange relations can also vary in *types* of resources exchanged (Schaefer 2009). We omit resource type since type cannot change incrementally.

promotes cohesion, relative to constant exchange. In this model, we describe how exchange dynamics create uncertainties about whether or how much exchange might occur across time, which actors seek to understand and predict.

An Attributional Model of Exchange Dynamics

Research on causal attribution typically identifies three objects of attribution: the person being observed, the specific object or context to which the person is reacting, and the broader situation within which the interaction or behavior is occurring (Kelly 1967). In a dyadic exchange relation, the relevant objects are the exchange partner, the relationship (e.g. the intra-relational context, such as the exchange task or how the relationship is developing), and the extra-relational situation (including other exchange opportunities). These objects of attribution range from internal to external: internal if the target of attributions is the disposition of the exchange partner and external if attributions are directed to factors beyond the person or the exchange relation.

The development of solidarity depends on which object is made salient for attributions. For instance, situational attributions can inhibit or undermine trust if acts of trustworthiness are attributed to external constraints, such as binding contracts, rather than the person's good will (Malhotra and Murnighan 2002; Molm et al. 2000). Instead, trust requires inferences about the person's own intentions and volitional acts. On the other hand, research suggests that cohesion depends on positive attributions to the relationship (rather than to the partner) to reinforce relational bonds (Lawler 2001; Kuwabara 2011). Thus, although trust and cohesion are typically positively correlated, they can develop separately through different processes. Whereas trust is based either on dispositional ("He seems trustworthy") or relational ("We have a stable and committed relationship") attributions, cohesion specifically concerns the sense of unity or "we-

ness” based on the strength of relational bonds between actors. It is therefore possible, for instance, to trust relative strangers without forming relational bonds.

Drawing upon these observations, we argue that, compared to constant exchange patterns, incremental exchange in resource size invokes relational attributions, but incremental exchange in frequency inhibits them, with direct implications for solidarity and cohesion. This claim follows from two key propositions. The first is that *which objects become salient targets of attributions depends on the locus of causal uncertainty*, which occurs when multiple objects are ambiguously implicated or identified as causal factors for the observed behavior or event (e.g. “Was X caused by the person’s disposition or the situation?”). We argue that, in exchange relations, the locus of uncertainty about what is motivating or shaping particular exchange patterns varies depending on whether an exchange decision concerns *how much* to give (exchange level) or *whether* to give (exchange frequency). Generally speaking, how much to give is a decision that occurs *inside* the exchange relation to allocate benefits between the self and the other, while whether to give is a decision that occurs *outside* the relation concerning whether to enter the relation or not (or choose another exchange opportunity).

The second proposition, based on Kelley’s (1967; 1972) covariation model of attribution, is that *behavioral patterns that occur consistently across time and space are more likely to invoke internal attributions than those that occur less consistently*. According to Heider (1958), internal objects are generally more stable and inherent sources of behavior, thus inducing consistent behaviors across situations. For example, observing a person who is consistently generous to everyone he meets is likely to invoke dispositional attributions to this person’s

personal attributes, but observing someone who is generous only to the observer is more likely to invoke attributions to their particular relationship.³

Figure 1 illustrates our basic model. The arrows link the loci of uncertainty to different objects of attribution that range from internal to external, depending on whether the exchange pattern is constant or incremental. Uncertainties that stem from exchange patterns in exchange level create attributional tension between the disposition and the relation, because decisions about how much to give are deliberate acts of exchange based on one's willingness to take risks and invest in the relationship, signaling how trusting or distrusting the giver is, on the one hand, and how much he values the relationship, on the other hand. Between the disposition and the relation, the covariation principle predicts consistency in exchange level to direct the focus of attributions internally to the disposition, while behaviors that change across time will draw the focus externally to the relation.

³ Kelly identifies distinctiveness and consensus as additional patterns that induce internal attributions. Distinctiveness concerns discrepancies in the observed person's behaviors towards different stimuli (e.g. other exchange partners), and consensus concerns discrepancies between people's behaviors toward the observer and the partner. Research shows that consistency is typically the most important factor (Fiske 2010: 106).

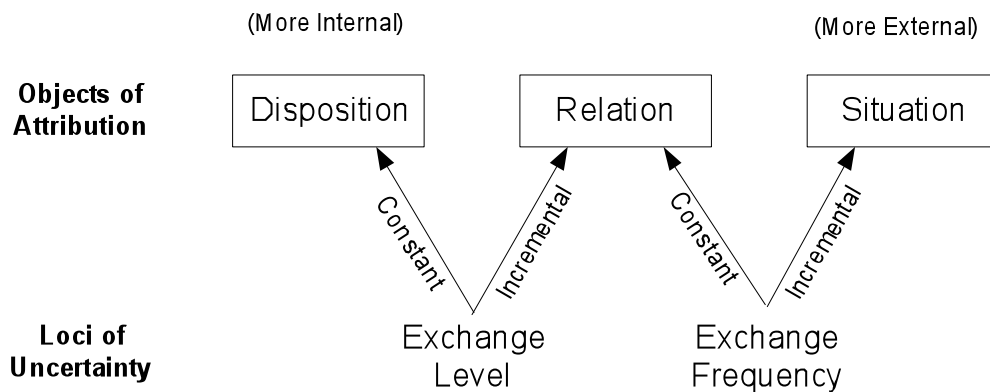


Figure 1. An attributional model of exchange dynamics: The locus of uncertainty determines which objects of exchange—ranging from internal to external—become salient. The arrows indicate attributions to different units of exchange.

In contrast, uncertainties that stem from exchange patterns in frequency create attributional tension primarily between the relation and the situation. This is because whether or not to exchange concerns acts of omission—not acting—that draw attributional focus away from the relationship to the extra-relational situation insofar as non-interactions can occur because of outside opportunities or alternative partners (Molm et al. 2006). Between the situation and the relation, exchange patterns that are consistent in frequency should invoke comparatively more internal attributions to the relation, whereas those that are less consistent should direct the focus of sense-making to the situation.

It is important to note that our model pertains to attributions based on exchange patterns only. In many situations, people offer alternative, verbal accounts for their exchange decisions (e.g., to a hungry colleague one distrusts: “Sorry, I left my wallet in my office...”). Such explanations may weaken or override the effects of actual exchange patterns, or they may be dismissed as cheap talk. Understanding how exchange patterns affect solidarity is important

insofar as people often observe and infer from each other's actions in the absence of, or regardless of, other causal explanations. In the next section, we draw upon our model to develop specific hypotheses about how incremental vs. constant exchange patterns might affect solidarity in general and cohesion in particular.

HYPOTHESES

Incremental Exchange in Resource Level

Our first hypothesis is that exchanging incrementally in resource level will produce greater levels of cohesion than exchanging constantly (at full or high levels). This follows from the idea that incremental exchange in exchange level is more likely to induce attributions to the more external object between the disposition and the relation. For example, person A who is consistently generous with gifts or favors from the beginning of a relationship is likely to be perceived as a generous person by disposition, whereas person B who eventually becomes equally generous but gradually so is more likely to be understood in the context of a growing relationship in which trust and commitment are earned gradually and given reciprocally between specific actors. We may still make dispositional inferences about B (e.g. "He must be shy"), but the basis of our inferences will become more relational as his behavior changes over time to signal increasing commitment to the relationship (e.g. "He is shy, but we have nevertheless grown closer to each other"). Thus, while person A's generosity might invoke feelings of trust toward her in particular,

it is in the context of the relationship with person B that we are more likely to experience relational bonds of cohesion.⁴

Hypothesis 1: Exchanging incrementally in resource level will produce higher degrees of relational cohesion than will exchanging constantly at a high resource level.

This prediction stands in apparent contrast to previous research. Pillutla, Malhotra, and Murnighan (2003) show that entrusting less than the full amount in trust exchange situations undermines reciprocity by signaling distrust toward the partner. Similarly, Molm et al. (2006: 2335) argue that sending less than the full amount of resources in gift exchange situations is an act of commission directed at the partner and thus heightens feelings of conflict that erode solidarity. However, Pillutla et al. (2003) studied only one-shot cases, and Molm et al. (2006) focused on differences in exchange forms that are time-invariant and did not manipulate or control exchange patterns; neither study therefore offers a direct look at how the temporal dynamics of exchange across repeated interactions affects solidarity. Our goal in this research is not to challenge these findings but to qualify them by introducing a temporal element to the framework for understanding social exchange. We claim that exchanges that are originally partial but incremental in exchange level over time will be construed as signals of increasing commitment and cohesion in spite of what may initially be perceived as distrust.

⁴ Our model is general enough to illuminate how other temporal patterns or conditions of exchange might affect solidarity. For instance, as already noted, actors might verbally offer alternative (e.g. situational) explanations even when the exchange decisions concern exchange levels (“I only have time for coffee; I have a meeting later.”). An important implication of our model is that, in such cases, incremental exchange patterns will invoke attributions to the situation instead of the relation (“He has more time for me now; work must be slowing down”), thus reducing rather than increasing cohesion. Our present case concerns default situations in which people make causal inferences based on exchange patterns only.

Incremental exchange in exchange frequency

Our second prediction is that the positive effect of incremental exchange on cohesion that we predict for exchange level may not hold—or may reverse—for exchange frequency. First, whether to initiate exchanges are decisions that occur outside of the relationship, leading to an external shift in the locus of uncertainty from disposition-relation to relation-situation. Whereas exchanging incrementally in exchange level consists of a sequence of partial but increasing resource levels, exchanging incrementally in frequency consists of a sequence of interactions and non-interactions. While exchanging partial amounts of resources amounts to “a glass increasingly full” that signals certain willingness to take risks and invest in the relationship, non-interactions are unlikely to signify such intent: one cannot “test the water” by avoiding it. Instead, exchanging incrementally in frequency results in intermittent exchanges that are more likely to be construed as “occurrences” (Kruglanski 1975) that may be accidental or situationally induced (“He calls me only when work is slow.”) than as intentional acts of commission directed at promoting the relationship (Molm et al. 2006).

Second, exchanging incrementally in frequency means completing fewer exchanges, reducing the probability as well as aggregate frequency (i.e. number of actual occurrences) of interactions. In turn, intermittent exchanges are less likely to feel like a coherent and durable relationship, reducing the relative salience or significance of the relationship (Molm et al. 2009). According to the covariation principle, variable patterns in exchange frequency thus draws the attributional focus away from the relation to the more external loci—i.e. the situation—thus inhibiting attachment to the relationship.

In short, the extent to which relational attributions occur on the basis of increasingly frequent exchanges to signal growing commitment may be offset by intermittent interactions that disrupt the continuity of sequential exchanges and raise the possibility that the exchanges are occurring more frequently only because of diminishing outside opportunities rather than increasing commitment. Instead of simply making relational attributions, then, the actor also looks to the situation to make sense of why interactions are occurring from time to time, thus limiting the extent to which feelings of cohesion develop.

Hypothesis 2: Exchanging incrementally in frequency will produce lower levels of relational cohesion than will exchanging at full frequency.

Our second hypothesis also speaks to past research. Molm et al. (2007) found that constant and immediate reciprocity produces more solidarity than intermittent (but non-incremental) reciprocity, even when the amount of resources exchanged in the aggregate is held constant. Whether this is still the case when reciprocity is incremental (i.e., increasingly less intermittent), however, remains an open question. There is some suggestive evidence that exchanging at increasing frequency might invoke relational attributions to create relational bonds. In earlier work, Molm et al. (2000) reported higher levels of interpersonal trust in exchange relations that developed gradually than those in which commitment stabilized early. They speculate that “the slow transformation of the reciprocal exchange relations, from uncertainty and instability to mutual predictability and benefit, produced the particularly high levels of trust” (1424). However, in their study, the exchange patterns were endogenous within each relationship. Our design manipulates exchange dynamics exogenously to enable a more direct test of whether

the greater levels of solidarity can be causally attributed to incremental exchange patterns, or vice versa.

Exchange Frequency x Level

The first two hypotheses concern whether exchange patterns in exchange level or frequency have independent effects on cohesion, holding the other constant. In real-life situations, however, exchange relations often vary in both exchange level and frequency, thus invoking dispositional, relational, and situational attributions at once. Our final question therefore concerns what predictions our model makes for such situations, specifically whether exchange patterns in exchange level might interact with frequency.

According to Kelly (1972), when there are mixtures of different patterns (e.g. exchange level and frequency) in the behaviors observed, they can point to divergent causes (relation or disposition) and discount or diminish the significance of either cause, or they can converge on a unique effect to reinforce its perceived effect. In our case, exchange patterns that are consistent in both exchange frequency and level point to the disposition (Hypothesis 1) and the relation (Hypothesis 2) as divergent causes, reducing relational attributions. Exchange patterns that are incremental in both exchange level and frequency point to the situation and the relation as two probable causes, also reducing relational attributions. Exchange patterns that are incremental in frequency but constant in size point to the situation and disposition, invoking no relational attributions. Only exchange patterns that are incremental in size but constant in frequency point to the relation as the convergent cause. Combined, these four cases suggest independent (additive or subtractive) effects of patterns in exchange level and frequency on cohesion, but it is unclear

whether these effects might interact). In other words, we cannot predict interaction effects on the basis of our current model.

Hypothesis 3: The effects of exchange patterns in exchange level and frequency will have independent effects on cohesion but will not interact.

All three of our hypotheses concern effects of exchange patterns on relational cohesion rather than solidarity in general or its other subcomponents, trust and affective regard. We focus on cohesion because it is the most relational component of solidarity and has received particularly focused attention by sociological exchange scholars in recent years (Molm et al. 2007a; Lawler et al. 2000; Lawler and Yoon 1996; Lawler and Yoon 1998; Schaefer and Kornienko 2009; Schaefer 2009; Kuwabara 2011). Moreover, as noted already, trust and affective regard can emerge from either relational or dispositional attributions or both, which makes it difficult to state or test precise predictions about whether patterns in exchange level would have any effect on trust or affective regard and, if so, to isolate the effects of relational attributions from dispositional attributions on them. In comparison, cohesion develops primarily on the basis of attributions to the relationship (Lawler 2001; Kuwabara 2011) and thus provides a more precise test of specific attributions in our model. We thus measured feelings of trust and affective regard for exploratory purposes.

OVERVIEW OF THE STUDIES

We tested our hypotheses in three laboratory studies. Study 1 manipulated exchange patterns to be incremental or constant in exchange level. Study 2 manipulated exchange patterns in exchange frequency. Study 3 crossed exchange pattern in exchange level with frequency.

We are by no means the first to discuss incremental interaction patterns. Rational choice models of trust building suggest incremental processes (Weber et al. 2005: 78; also Lewicki, Bunker, and Tyler 1996) in which “trust grows gradually as positive interactions accumulate,” allowing “each party to take successively larger risks as trust grows.” Our model of exchange differs from such models in two important ways. First, our model is prescriptive rather than descriptive; our question is not what types of exchange patterns tend to occur naturally, but how they affect feelings of solidarity. Second, and more crucially, our model concerns how exchange patterns create expressive value rather than how they maximize instrumental value.

Perhaps the most relevant research outside of sociology is by Aronson and Linder (1965) on the loss-gain hypothesis, which posits that people are more often attracted to others who initially dislike them but then come to like them than those who like them from the start. Their explanation is that we view those who dislike us initially as more discriminating, and we enjoy earning their liking. However, their research measured interpersonal liking, which exchange theory distinguishes from either trust or cohesion (Molm Molm et al. 2007a; Kuwabara 2010). Further, their independent variable was the partner’s feelings toward the participant (as revealed verbally to the experimenter and overhead by the participant) that changed from negative to positive over the course of a series of seven short conversations. They did not examine the effects of exchange patterns differing in the frequency or size of resources exchanged. In real-life

interactions, people often make inferences from exchange patterns alone, because verbal feedback is not always available or reliable.

Exchange Tasks

In all studies, participants performed a series of “reciprocal exchange” tasks (Molm et al. 2000) with an anonymous partner. At the beginning each round, one player (the sender) received an endowment of E points and decided how much (Study 1 and 3) or whether or not (Study 2) to give to the other (the receiver). In the next round, the roles were reversed.⁵ Points sent to the receiver, $S \leq E$, was multiplied by 1.5, while remaining points not sent to the receiver, $E - S$, was automatically spent on a lottery, which earned $1.5(E - S)$ with 50% probability and $E - S$ (no additional profit) otherwise. Thus, keeping points earned an expected profit of $1.25(E - S)$, while sending points to the partner earned no immediate profit, only through reciprocity.

Whereas negotiated exchanges are relatively discrete events in which (in)equality of benefits are determined or negotiated within each transaction, reciprocal exchanges are sequentially contingent: whether or how much I reciprocate depends in part and implicitly on what you have given me in the previous episode of exchange, and (in)equality thus emerges over time (Molm 1994). In the present research, we focused on reciprocal exchange because its sequential nature suggests that temporal exchange patterns may play a more important role in social exchange, as Molm et al. (2000) suggest.⁶

⁵ In other studies (e.g. Molm et al. 2000), actors send points simultaneously. We made the exchanges sequential so that the preprogrammed partner could take the lead to start with high or low entrustments.

⁶ In negotiated exchange, exchanging incrementally in resource size is constrained by the very fact that the allocation of benefits is determined bilaterally; in negotiation, one cannot voluntarily give more and more.

Experimental manipulations

In all three studies, the partner in each dyad was simulated (unbeknownst to the participant) and programmed to exchange either incrementally or constantly.⁷ In the constant exchange conditions, the partner was programmed to entrust the entire endowment in every round. In the incremental-size conditions (Studies 1 & 3), the partner was programmed to entrust 1/3 of E at first and gradually increase the exchange level to E halfway through the exchange rounds. In the incremental-frequency conditions (Studies 2 & 3), the partner was programmed to offer points with 33% probability in the beginning half of the exchange rounds and 100% probability in the remaining rounds.⁸

Measures and Analyses

After the exchange rounds, participants were asked to complete a post-study questionnaire consisting of 7-point Likert-scales on feelings of solidarity, based on Lawler and Yoon (1996, 1998) and Molm et al. (2000, 2007a). Items on cohesion, the main dependent variable, concerned the exchange relation. Participants were asked how close/distant, cohesive/incohesive, and team-/self-oriented their exchange relationship felt. Items on trust and affective regard concerned participants' evaluation of their exchange partner. For trust, participants were asked how much they trusted/distrusted their partner and how trustworthy/untrustworthy, reliable/unreliable, and

⁷ We used computer-simulated our exchange partners to ensure more rigorous control over exchange patterns. In free-play settings with actual human partners, the level of solidarity could be the cause or the consequence of exchange patterns. While acknowledging the endogeneity of exchange dynamics in real-world exchange relations, our goal is to isolate the causal effects of exchange patterns on relational cohesion to shed important light on this neglected aspect of exchange dynamics.

⁸ For additional realism, the exchange partner was pre-programmed to respond to exploitations (conceptualized as the participant offering less than half of what was given to the participant in the previous round) by reducing offers by 2-3 points or withholding offers with 65% probability.

predictable/unpredictable they found their partner. For affective regard, participants were asked how cooperative/uncooperative they found their partner and how positive/negative and pleased/displeased they felt towards their partner. All inter-scale reliability coefficients were above .85 for all studies. In factor analysis, cohesion consistently emerged as a distinct factor from trust and affective regard.

As a manipulation check, we included a question in the post-experimental questionnaire about how cautious or incautious participants found their partner (“How cautious was your partner, in your opinion?”). If the exchange patterns are sufficiently salient, participants in incremental exchange conditions should perceive their partners to be more cautious; they did for each study. We also examined the actual patterns of exchange in order to ensure that participants behaved differently in incremental vs. constant exchange conditions; they did.

In each study, we performed mean comparisons using Mann-Whitney tests and OLS regression controlling for participants’ age, gender, and race. Effects of these controls were non-significant or inconsistent in all cases and are thus not reported. We also controlled for total earnings. Because the earning potential (i.e. instrumental value) differed between the incremental and constant conditions, we measured relative earning as the difference between the participant’s earning and the average earning by condition. The results we report control for earnings, but are robust to excluding it.

STUDY 1: EXCHANGE LEVEL

The goal of this first study was to test Hypothesis 1, that is, whether exchanging incrementally in resource level produces higher degrees of relational cohesion than does exchanging constantly at a high resource level.

Design and Procedure

Thirty-four students (16 men, 18-34 years old) were recruited from mailing lists for 45 minutes of participation in return for monetary compensation. Each session consisted of four to eight participants. Upon entering the laboratory, they were seated separately in a cubicle with a computer terminal. After signing the consent form promising anonymity and reading detailed instructions to ensure complete understanding of the experimental rules and protocols, participants were randomly assigned to either the constant or incremental exchange condition.

Players took turns playing the role of the sender and the receiver for 30 rounds. In each round, the sender received an endowment, E , ranging from 6 to 12 points. In the constant exchange conditions, the simulated partner was programmed to always entrust the maximum possible points in all exchange rounds. In the incremental exchange conditions, the simulated partner entrusted $1/3$ of the endowment initially, gradually increasing the resources given to the full amount of the endowment by round 15. For realism, the partner in all conditions was programmed to reduce the entrustment by 2-5 points, depending on the size of the endowment, immediately after getting exploited, defined as receiving less than given. However, to ensure that

exchange frequency is held constant (and full), the exchange partner was programmed to always send at least 2 points (that is, to never send 0 points).⁹

In round 1, the simulated partner was the sender. To obtain a behavioral measure of cooperation, we intentionally induced an end-game effect by announcing the final two rounds on the computer screen. In the penultimate round, the partner was programmed to receive an endowment of 10 points and send all 10 points. In the very last round, the participants also received an endowment of 10 points as the sender. Because there is no instrumental reason to send points in the last round, this amount is presumed to reflect the level of cohesion, i.e. their commitment to and identification with the relationship, rather than trust.¹⁰ After completing the exchange rounds, participants were asked to complete a post-study questionnaire. Finally, participants were sensitively debriefed, paid, and thanked for participation.

Results and Discussion

Table 1 reports the unadjusted means and standard deviations of our dependent and control variables by experimental conditions. Participants perceived their partners to be more cautious in the incremental than the constant condition ($z = 3.37, p < .01$), validating the manipulation.

The results provide clear support for our first hypothesis that exchanging incrementally in resource level—entrusting more and more—can produce greater levels of cohesion than exchanging at a full and constant level. As Table 1 shows, cohesion was greater in the incremental exchange condition ($z = 2.47, p = .01$). Regression also found a positive significant

⁹ Our design results in participants in incremental exchange earning less, which provides a more conservative test of Hypothesis 1. We did not control for expected earnings in regression, because they co-vary with the conditions.

¹⁰ However, entrustments in the last round could reflect regard for the partner. It is therefore not an exclusive measure of cohesion.

effect of incremental exchange ($\beta = .84, p < .01$) on cohesion. Finally, as a token of cohesion (Lawler et al. 2000), those in the incremental exchange condition gave more points to the partner in the last round: 3.3 points on average compared to 1.2 in the constant exchange condition ($z = 1.67, p = .09$).

On the other hand, we found no significant difference in levels of trust ($z = 1.10, p = .29$) or regard ($z = .94, p = .35$). A likely explanation is that, as already noted, cohesion develops primarily on the basis of relational attributions, but trust and affective regard can emerge from relational or dispositional attributions, or both. This means that shifting the locus of attribution from the disposition (e.g. in constant exchange) to the relation (e.g. in incremental exchange) may not affect feelings of trust and affective regard in the same way or to the same extent as it would affect cohesion. People are perhaps likely to trust an exchange partner who has given more and more as one who has given all from the beginning.

Table 1. Means and standard deviations, Study 1

Exchange pattern	Cautious	Cohesion	Trust	Affect	Sent in last round (out of 10 points)
Constant	3.41 (1.70)	3.84 (.72)	5.02 (.86)	5.27 (.86)	1.18 (.22)
Incremental	5.47** (1.23)	4.61* (.85)	5.35 (.89)	5.32 (1.26)	3.29+ (.40)

Notes: Asterisks denote differences from the constant condition in Mann-Whitney two-tailed tests, + $p < .1$, * $p < .05$, ** $p < .01$.

STUDY 2: EXCHANGE FREQUENCY

The goal of Study 2 was to test Hypothesis 2, that is, whether exchanging incrementally in frequency produces *lower* degrees of relational cohesion than does exchanging constantly at a high resource level.

Design and Procedures

Fifty-six students (23 men; 18 to 35 years old) participated for monetary compensation. The design and procedures were adopted from Study 1, with a few modifications. First, the exchange task allowed only binary, send-or-keep-all decisions in order to hold exchange level constant. In the constant exchange condition, the partner sent the full endowment to the participant in every round by default. In incremental exchange, the partner sent points at a 30% chance during the first 30 rounds and at a 100% chance in every round thereafter. In both conditions, the partner was programmed to withhold points with 65% chance if the participant defected in the previous round.

Second, in order to rule out the possibility that exchanging incrementally in frequency undermines cohesion simply because of the reduced number of exchanges rather than the rate of exchange, we added a third condition (*incremental-long*), which provided additional rounds of non-intermittent exchange at the end, such that the total number of actual offers from the partner was the same as in the constant-exchange in the aggregate. Specifically, there were 50 exchange rounds in constant and incremental conditions and 62 in the incremental-long condition. Since the 12 additional rounds can bias the results in other ways—such as increasing the overall duration of the exchanges or creating more opportunities for exploitation—beyond simply controlling for the overall number of interactions, this control condition is not perfect. Together,

however, the two incremental exchange conditions help isolate the effect of incremental rate of exchange from the effect of the aggregate number of exchanges.¹¹ Using these conditions, we wanted to see if the incremental patterns in frequency produce less cohesion because of the intermittent interactions (and not simply because of the reduced exchange opportunities in the aggregate).

Results and Discussion

Table 2 summarizes the means and standard deviations. The results provide clear support for Hypothesis 2: constant exchange in frequency produced greater cohesion than either incremental exchange ($z = 2.51, p = .012$) or incremental-long conditions ($z = 2.13, p = .033$). Regression shows that the effect of the incremental conditions are both significant and negative ($\beta = -.89, p = .033$ for the incremental condition; $\beta = -.81, p = .04$ for the incremental-long condition) relative to the constant-exchange condition as the baseline. No statistically significant difference was found between the two incremental exchange conditions.¹² In the end-game, each incremental condition obtained a marginally significant negative effect ($\beta = -.22, p = .01$ for the incremental condition; $\beta = -.21, p = .09$ for the incremental-long condition) in regression, although neither was significantly different in bivariate tests.

¹¹ We retained the standard incremental-exchange condition (with 50 rounds), because adding additional rounds of interactions also necessarily increases the overall duration of interactions, from 50 to 62 rounds, which may confound our results. For instance, the additional rounds may simply provide more opportunities for exploitation instead of mutual cooperation. Finding no differences between our standard and long conditions would help ward off such concerns.

¹² This does not mean that aggregate number of occurrences has no effect or is less important than exchange pattern. Rather, the addition of 12 extra rounds was insufficient to produce significant effects on the main effect of exchange frequency. Moreover, number of exchange occurrences and rate of exchange cannot be compared directly. However, our results provide compelling demonstration that incremental exchange in frequency can reduce cohesion, even after controlling for exchange frequency.

In Study 2, trust and regard followed the same pattern as cohesion, higher in the constant condition than the incremental conditions. In regression, both of the incremental conditions obtained negative effects on trust ($\beta = -.86, p = .019$ in the incremental condition; $\beta = -.62, p = .074$ in the incremental-long condition) and regard ($\beta = -.80, p = .04$ in the incremental condition; $\beta = -.76, p = .036$ in the incremental-long condition). Thus, the findings for all three subcomponents of solidarity are consistent with the key premise of our model that incremental exchange in frequency promotes neither dispositional nor relational attributions, because intermittent exchanges heighten the relative salience of the extra-relational situation over dispositional or intra-relational factors.

Table 2. Means and standard deviations, Study 2

Exchange pattern	Cautious	Cohesion	Trust	Affect	Sent in last round (% of participants)
Constant	4.61 (1.85)	5.20 (1.22)	6.00 (0.84)	5.81 (1.00)	.33 (.49)
Incremental	5.61 ⁺ (1.19)	4.24* (1.10)	5.02* (1.18)	4.98 ⁺ (1.33)	.11 (.32)
Incremental long	5.60* (.75)	4.40* (1.02)	5.30 ⁺ (1.02)	5.12* (.96)	.16 (.38)

Notes: Asterisks denote differences from the constant condition in Mann-Whitney two-tailed tests, ⁺ $p < .1$, * $p < .05$, ** $p < .01$.

STUDY 3: FREQUENCY x SIZE

In the first two studies, we manipulated exchange level or frequency while holding the other constant—in effect eliminating the situation or the disposition as targets of attributions in order to simplify our tests/predictions/scope of analysis to binary cases between the disposition and the relation or the relation and the situation. However, many exchange relations vary in both

exchange level and frequency, thus invoking dispositional, relational, and situational attributions simultaneously. Our final study was designed to replicate the main findings from the first two studies simultaneously with additional data and to see whether exchange patterns in frequency and size interact or not. Our model is incomplete insofar as we find an interaction effect.

Design and Procedures

Ninety five participants (49 men, 18 to 34 years old) were randomly assigned to a condition in a 2 X 2 factorial design crossing exchange patterns (incremental vs. constant) in exchange level vs. frequency. In all conditions, participants completed 50 rounds of exchange with a simulated partner. As in Study 1, the sender received an endowment and decided how many points to send. Unlike in Study 1, it was possible to offer no points, and such instances were announced to the participant as non-exchanges instead of 0 points to make exchange frequency salient.

Endowment was 12 points in order to ensure that incremental patterns in exchange level were discernible enough despite disruptions by non-interactions. In the constant condition, the exchange partner was programmed to send the entire endowment to the participant in every round (unless the participant defected in the previous round). In the incremental size (constant frequency) condition, the partner sent 30% of each endowment in the beginning. In the incremental frequency (constant size) condition, the partner sent the entire endowment with 30% probability in the beginning. In the incremental-size x incremental-frequency condition, the exchange partner sent 30% of the endowment with 30% probability. In all incremental exchange conditions, the exchange partner gradually increased to full exchange level and/or frequency by round 25. All other procedures were identical to Studies 1 and 2.

Results and Discussion

Table 3 summarizes the means and standard deviations. As shown, cohesion was the highest in the incremental-size x constant-frequency condition and lowest in the incremental size x incremental-frequency condition. Exchanging incrementally in size produced more cohesion, whether the exchange pattern in frequency was constant or incremental. Conversely, exchanging incrementally in frequency produced less cohesion, whether the exchange pattern in size was constant or incremental. Regression produced a positive main effect of exchanging at constant frequency ($\beta = .72, p < .05$) and a negative main effect of exchanging constant size ($\beta = -.66, p < .05$). The interaction effect is non-significant. Entrustments in the last round show convergent patterns. Regression found a positive effect of constant entrustment frequency ($\beta = .18, p = .03$) and a negative effect of constant entrustment size ($\beta = -.20, p = .02$), but no interaction effect.

Table 3. Means and standard deviations, Study 3

Exchange pattern	Cautious	Cohesion	Trust	Affect	Sent in last round (out of 12 points)
Const. size x Const. frequency	4.28 (1.17)	4.43 (1.15)	5.30 (1.16)	5.41 (1.06)	5.36 (5.10)
Inc. size x Const. frequency	5.04* (1.52)	5.22* (.97)	4.96 (1.20)	5.22 (1.35)	6.88 (5.29)
Const. size x Inc. frequency	4.92+ (1.22)	3.79+ (1.04)	4.5** (1.03)	4.60** (1.12)	2.54* (4.36)
Inc. size x Inc. frequency	5.09* (1.77)	4.50 (.93)	3.82** (.85)	4.45** (.91)	5.27 (5.37)

Notes: Asterisks denote differences from the constant x constant condition in Mann-Whitney two-tailed tests, + $p < .1$, * $p < .05$, ** $p < .01$.

The results for trust and affect are also consistent with our previous studies. Trust decreased with incremental exchange in frequency ($\beta = -1.24, p < .01$) but was unaffected by the exchange patterns in resource size ($\beta = .29, p = .39$). Similarly, affect decreased with incremental

exchange in frequency ($\beta = -1.02, p < .01$) but was unaffected by the exchange patterns in resource size ($\beta = .15, p = .68$). No interaction effect was found for either trust or affect.

GENERAL DISCUSSION

Implicitly or explicitly, research on exchange relations has turned to theories of attribution to explain how different forms of exchange (Lawler 2001; Molm et al. 2007a), external incentives (Malhotra and Murnighan 2002; Yamagishi and Yamagishi 1994), or types of resources (Schaefer 2009; Kollock 1994) condition the development of solidarity in repeated exchanges. We contribute to this line of research by extending the logic of attribution to temporal patterns of exchange. Whereas research to date has focused on relatively static or aggregate properties of exchange, we examined how exchange dynamics shape the development of solidarity. Many relations develop incrementally as actors “test the waters,” whereas other relations emerge and stabilize quickly after actors take “leaps of faith” in each other. Do these exchange patterns result in different levels of solidarity, and if so, why? These questions have both practical and theoretical implications for understanding how to build cohesive relations at work and elsewhere, why some relations survive, and why some relations loom more significant or meaningful.

Our starting point is the notion that cohesion develops on the basis of attributions to the relationship (Lawler 2001). However, to what extent the relationship actually becomes the object of attributions depends on two key factors. First, the *locus of uncertainty* determines which units of exchange—the situation, relation, or disposition—become salient targets of attributions. We argued that decisions about how much to give create causal uncertainties between the disposition and the relation (i.e. how trusting the giver is vs. how much he values the relation), whereas

decisions about whether to give create uncertainties between the relation and the situation (i.e. whether the giver is willing to enter the relationship or inclined to pursue an outside option. Second, *consistent behavioral patterns* are more likely to invoke attributions that focus on internal objects, according to Kelly's (1962) covariation principle.

Combined, these factors explain why incremental exchanges in exchange level and frequency have *opposite* effects on cohesion. Our attribution model of exchange dynamics suggests that incremental exchange patterns can promote or inhibit cohesion, because the basis of attributional tension shifts from disposition-relation to relation-situation or vice versa, depending on whether exchange patterns vary in exchange level or frequency. Exchanging incrementally in exchange level draws the focus of causal attributions externally from the disposition of the partner to the dynamics of the exchange relation, signifying growing commitment to the relationship. In contrast, exchanging incrementally in frequency disrupts the continuity of interactions and draws attention to the situation as the target of attributions, diminishing the salience of the relationship. Our argument was supported in three laboratory studies. First, our results show that exchanging incrementally in resource level can produce higher levels of cohesion than exchanging at constant resource level. Second, exchanging incrementally in frequency can inhibit the development of cohesion. Third, exchange patterns in exchange level and frequency can co-vary, but according to our model and results, they have independent effects only.

Our results speak to past findings on the efficacy of hedging in exchange relations. Pillutla et al. (2003) found, for instance, that offering less than the entire endowment signals distrust and reduces reciprocation from the partner. In their studies, participants playing trust games felt “exponentially” less obligation to reciprocate the less they received from the trustor.

However, this pattern was observed in one-shot interactions. Our research suggests that, in repeated exchanges, some hedging in exchange level might more likely reinforce relational bonds than making full offers from the outset would.

On the other hand, hedging in exchange frequency might be counterproductive. As Studies 2 and 3 show, incremental exchange in frequency amounts to intermittent exchanges that divert positive attributions to the relationship and disrupt the transformation of instrumental exchanges into something more expressive, symbolic, and relational. This point converges with past research (e.g. Lawler 2001) to highlight the importance of exchange frequency as an essential ingredient in the development of solidarity.

More generally, by manipulating exchange patterns while holding aggregate frequency of interactions constant, our research suggests that merely aggregating positive interactions might not be sufficient to reinforce solidarity. As Molm et al. (2007: 215) note, simply being linked to others through social networks is not enough: “actors can exchange repeatedly with others without developing trust and affective bonds.” Put differently, this means that maximizing the instrumental value of exchange does not ensure maximum expressive value. Rather, the development of solidarity requires that exchanges trigger attributions directed specifically at the person or relationship (or both). The relationship becomes a salient object of such attributions when exchanging incrementally in exchange level or exchanging at constant frequency.

Although exploratory, the results for trust and affective regard provide further support for our model. They converged with cohesion for the most part but diverged in important ways, consistent with the notion that they are distinct components of solidarity from cohesion. Specifically, incremental exchange in frequency had the same negative effect on cohesion as well as trust and regard (Study 2), but exchange patterns in resource level affected cohesion only

(Study 1). These patterns point to the idea that, unlike cohesion, trust and affective regard can develop on the basis of attributions to either the relationship or the partner or both.

By design, our experiments are highly stylized and carefully controlled in order to isolate the effects of exchange patterns in exchange frequency and level. For this reason, we used well-defined payoff points and exchange opportunities. Outside of the laboratory, actual exchange frequencies and levels can be vague; for instance, the size of the endowment (how much one can maximally give) or the baseline frequency of exchange opportunities (how often two people could maximally exchange) is often unknown. Is a 30 minute coffee meeting generous? Are weekly dates frequent or infrequent? In many cases, however, our expectations are guided by relatively unambiguous norms and mutual understanding. Our argument for what is considered incremental or consistent exchange patterns does not preclude personal expectations and interpretations insofar as our analyses focused on subjective feelings of solidarity. At the same time, an important scope condition is that, whether the exchange pattern is constant or incremental, it must be a sufficiently salient feature of the exchange relationship in order to invoke relevant attributions. Incremental exchange patterns that stabilize too fast or too slow may be ineffective (Hsee, Abelson, and Salovey 1991). Similarly, beginning exchanges too infrequently or too cautiously might risk the relationship ending prematurely. Although examining such variations in the functional forms of exchange dynamics was outside the scope of our present research, it will be a critical step towards better understanding how cohesive relationships form and endure.

In all three studies, we restricted our experimental design to dyads as the main unit of analysis in order to isolate the intra-relational dynamics of exchange patterns from the extra-relational dynamics of power-dependency and selective commitment in larger networks (for

similar designs, see Lawler and Yoon 1993; Lawler and Yoon 1996). We acknowledge that no dyad occurs in complete isolation, and our model of exchange makes explicit provisions for situational attributions to outside relations and exchange opportunities. Still, not all outside exchange opportunities are with active or reactive actors who commit and solicit commitment in return; in our case, we held structural power constant and fixed by using lotteries with certain expected payoffs as exchange alternatives that are essentially passive. As such, our goal was to take a first step towards testing our model's implication that, holding structural power constant and fixed, differences in exchange patterns (incremental vs. constant) and decisions (exchange level vs. frequency) between two people are enough to induce different attributions and ultimately, levels of cohesion; they are. Nevertheless, more research is needed to test the implications of exchange patterns in larger exchange networks.

These concerns notwithstanding, our research makes a compelling case for paying greater attention to the dynamics of exchange relations. Sociological theories have paid far greater attention to networks in stasis, ignoring how individual relations emerge, evolve, stabilize, or vanish, and how actors perceive such changes. Some exchange relations start out slowly cautiously as actors hedge against risks of exploitation, gradually stabilizing into cohesive exchange relations through sequences of incremental exchanges, while other relations quickly settle into full and constant exchange to maximize the value of each exchange. These early exchange patterns have significant implications for how actors come to view each other and the relationship.

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