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REPLY

The Relationship Trajectories Framework: Elaboration and Expansion

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We are delighted to have received such thoughtful, detailed commentaries on our target article. Although the relationship trajectories framework is simply a first attempt at a broader structure for conceptualizing time in relationships, we are encouraged that it sparked so many creative and novel ideas among these excellent scholars. If the framework proves to have lasting impact, we hope first and foremost that it inspires researchers to tackle a diverse array of research questions like those articulated by the commentators. We were also pleased to discover many key areas of agreement across the commentaries: For example, there is considerable enthusiasm for work that bridges the empirical gap between initial attraction and relationship formation, and there is optimism that the framework will aid in integrating close relationships research and the evolutionary psychology of human mating.

We are also grateful to these scholars for taking the time to sensitize us to issues in the target article that were oversimplified, underdeveloped, or missing entirely. What follows is a five-section response to the various issues that the commentators raised. The first section reviews specific questions that, collectively, revolve around whether the framework could be more expansive or structured differently. The second section discusses the concept of relationship readiness and, more broadly, the exciting challenge of assessing features of an individual before a relationship begins. The third section explores the connection between evolved, functional systems and relationship length, and it considers cases where categorical thinking about relationships may or may not be generative. The fourth section incorporates the diagnostic situation into the framework as a key example of a discontinuous, idiosyncratically timed predictor. The fifth and final section expands the framework beyond the monogamous norm to incorporate the broader *relationship ecosystem*, which includes a wider variety of relationship types (e.g., polyamorous relationships, friendships) and a consideration of the needs and goals that people seek to fulfill through particular relationship partners.

The Structure of the Framework: How Flexible is It?

There is, in principle, an infinite number of dimensions that one could use to carve up longitudinal data on relationships. One goal of our target article was to impose some basic structure on this universe of possibilities; we wanted to give scholars a common platform from which to address their own research questions about how relationships shift and change over time. Some of this structure, of course, is flexible, given the specific needs and goals of the individual researcher. We now review four questions about the flexibility of our framework that arose in the comments, beginning with the least flexible element (i.e., core structural components of the framework) and progressing to the most flexible.

Why Impose the Structure of "Arc-Shaped Evaluative" Trajectories?

Longitudinal methods are already in widespread use in the close relationships literature. Our framework was intended to provide some theoretical structure for this methodological practice, and the most basic structural element that we imposed is the arc-shaped evaluative trajectory (and the accompanying rocket metaphor). Arcs informally permeate the relationships literature already (see Bradbury & Karney, 2013), but the relationship trajectories framework formalizes two elements of the arc concept. First, a normative depiction of an arc would have (at a minimum) an ascent, a peak, and a descent, and so the application of this metaphor implies that any complete description of a reasonably sized sample of relationships should consider at least these three basic elements. Second, any "upstream" variable of interest can affect ascent, peak, and/or descent, and these effects can take the form of discontinuous jumps or changes in slope (Singer & Willett, 2003). Like other depictions of normative psychological processes, the arc is intended to help researchers think about the typical relationship—and deviations thereof—in a consistent, comparable, and translatable way.

Nevertheless, it is possible that a more complete depiction of shape—while bearing in mind the value of parsimony—would require the addition of plateaus or discontinuities, as suggested by Clark, Adkins, and Beck (this issue). If researchers documented a normative plateau or discontinuity that applied generally across relationships at a particular point in time (e.g., halfway between the beginning of a relationship and its peak), we agree that the shape concept should be expanded and the rocket metaphor may need to be altered accordingly. However, we suspect that plateaus and discontinuities are likely to be linked to specific, sporadically distributed relationship events.

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For example, the transition to parenthood predicts a discontinuous drop in satisfaction (e.g., Doss, Rhoades, Stanley, & Markman, 2009; Rholes, Simpson, Campbell & Grich, 2001), just as Clark et al. hypothesize that committing to a relationship predicts a discontinuous drop in three relationship initiation processes. In our view, these shifts are better characterized as *effects of particular variables on* ascent and/or peak and/or descent (depending on when the effects occur in the arc) than as additional systematic, normative elements of shape.

Why Impose the Structure of "Valenced Judgments"?

In the relationship trajectories framework, the *y*-axis represents valenced judgments, a broad category that includes the myriad evaluative variables that relationships researchers tend to examine (e.g., romantic interest, relationship satisfaction, commitment, trust; Finkel, Simpson, & Eastwick, 2017; Fletcher, Simpson, & Thomas, 2000). Clark et al. (this issue) posit that researchers could examine a wider variety of "intra- and interpersonal thoughts, feelings, and behaviors" (p. XX) in this manner, and Arriaga, Hunt, and Agnew (this issue) implicitly expand the *y*-axis to include aggressive behaviors in their discussion of thresholds. Generally speaking, we are enthusiastic about these nonevaluative expansions of the *y*-axis; in principle, any continuous construct that varies in intensity (e.g., emotion, effort expenditure) or frequency (e.g., thoughts, conflicts, behaviors) can be depicted on the *y*-axis. Indeed, Eastwick, Keneski, Morgan, McDonald, and Huang (2018) reported trajectory data on the three Clark and Beck (2011) constructs (i.e., the desire to make a favorable impression, to carefully evaluate the partner, and to self-protect), even though these constructs are not valenced judgments, strictly speaking. Other researchers might want to use the dyadic applications of the framework to depict participants' evaluations of their partners alongside other variables that are not valenced judgments, such as a participant's *perception* of the partner's evaluation of him or her (i.e., reflected appraisals; Arriaga et al., this issue; J. G. Holmes, personal communication, October 4, 2018).

Two caveats are in order, however. First, the framework is designed to cleanly separate evaluative variables from those that index structural closeness/or interdependence—variables that conceptually describe the dyad itself. To the extent that shared activities and self-other overlap (Clark et al., this issue) capture structural interdependence rather than valenced judgments, they will typically belong on the *z*-axis, not the *x*-axis (see Figure 7 in our target article). Second, the available data suggest that evaluative variables are more likely than nonevaluative variables to assume the form of arcs over the full course of the average relationship. In the Eastwick et al. (2018) trajectory data, for example, the valenced constructs (e.g., romantic interest, sexual desire, desire to care) exhibit ascents, peaks, and descents. The less evaluative constructs often do not exhibit arc-like patterns: Some start high and descend (e.g., the desire to make a favorable impression, the desire to self-promote), and some are uniformly distributed throughout the course of the relationship (e.g., feeling competitive with same-sex rivals for the partner's affections). As researchers continue to separate global evaluations from the functional systems that underlie them (Maner, this issue), they may find that some underlying systems are appropriately depicted as arcs, whereas others are not. Researchers, therefore, should remain aware that, as they stray from depicting valenced judgments on the *y*-axis, the arc metaphor may prove less useful for those particular constructs.

Why Impose the Structure of "Sexual or Romantic Relationships"?

Both Arriaga et al. (this issue) and Clark et al. (this issue) suggest expanding the framework to include other kinds of relationships, such as friendships, family relationships, or any close relationship that helps fulfill a person's needs. This is a very good suggestion: Such an expansion permits the density dimension to become much richer than we originally envisioned, as we describe in the upcoming section titled The Relationship Ecosystem. The only caveat we offer is that it is not obvious to us whether nonvoluntary relationships or platonic relationships can be appropriately depicted as evaluative arcs over time (e.g., Do people's positive feelings about their siblings normatively rise, peak, and fall?). Once again, if we jettison the evaluative arc, the shape dimension ceases to provide much structure.

Is "Synchrony" the Sixth Dimension?

Arriaga et al. (this issue) suggest that dyadic applications of the framework could reflect a sixth "synchrony" dimension. This is a perfectly reasonable reorganization of the framework, and there may be value in depicting this dimension on the same conceptual plane as the other five. Indeed, it may be helpful to consider that the first four dimensions (shape, fluctuation, threshold, and composition) apply to one person's evaluation of his or her partner; the fifth dimension (density) expands the framework along the *x*-axis (i.e., time) to include multiple (often overlapping) partners; and the proposed sixth dimension (synchrony) expands the framework along the *z*-axis to include partners' evaluations of each other. We hasten to note, however, that the synchrony dimension would need to be divided into the three subcomponents described in the target article (i.e., $Y_A \rightarrow Y_B$, trajectory similarity $\rightarrow$ Y, and Z $\rightarrow$ Y), and there may be other important subcomponents we did not articulate. These are only a few of the possible ways in which synchrony could be conceptualized and measured, and we encourage future researchers to address this issue in greater depth.

Getting Ready for a Relationship

By conceptualizing the beginning of a relationship as the initial encounter, the relationship trajectories framework trains a spotlight on the challenge of separating features of the individual from features of the relationship.

The beginning of a relationship has traditionally been defined as its "official" formation, that is, the moment two people agree that they are romantic partners. Thus, a researcher who administers questionnaires prior to this moment (i.e., among a sample of single people) would seem to be collecting reports of individual differences that are "uncontaminated" by the impact of a current partner. However, once we recognize that most evaluative arcs are already taking shape well before official relationship formation—and that many relationships never become official (e.g., hookups; Conley, Gusakoa, and Piemonte, this issue)—purported features of individuals can be shaped by a romantic/sexual partner earlier than scholars might have presumed.

Several of the commentators touch on this critical issue. Arriaga et al. (this issue) astutely note that personal timing—whether a person feels ready for a relationship or not—is a vital and understudied construct (Hadden, Agnew, & Tan, 2018; see also Clark, Beck, & Aragón, in press). They observe that people who are ready for a relationship may be more likely to initiate and maintain a longer lasting relationship, whereas people who are not ready might be willing to initiate only short-term or less committed involvements. Maner (this issue) uses trips (i.e., vacations vs. sabbaticals) as an analogy for two distinct, functional systems (i.e., sexual behavior and pair-bonding) that may explain why relationships differ from one another. One implication of this analogy is that a person could presumably engage in different behaviors depending on whether he or she was getting ready for a trip that served a vacation or a sabbatical function: For example, one would pack differently depending on whether the trip is meant to be recreational (i.e., a vacation) or enriching (i.e., a sabbatical). The unifying idea is that there are things we can learn about people, such as their relationship readiness and their motivational priorities, before they begin a relationship that can provide important clues about how the relationship will turn out.

We would like to articulate an alternative hypothesis, not because we necessarily embrace it—at least in its strongest form—but because we think it is a null hypothesis worth taking seriously: What if there is very little we can learn about a relationship prior to its outset? That is, what if people who say they are ready for a relationship are primarily describing their discovery of a person they find romantically inspiring (despite not yet having formed a relationship with him or her) rather than a general receptivity to long-term involvements? What if some relationships are like vacations and some are like sabbaticals, but at the start, people pack identically and then figure out which trip they are taking well after they have already departed? These examples stretch credulity when the beginning of the relationship is defined as its official formation, but they may be quite plausible when one realizes, as we discuss in the target article, that relationships often have long prologs.

A handful of studies have accounted for relationship outcomes using individual differences assessed many years earlier—before the launch of the trajectory to be predicted (e.g., Penke & Asendorpf, 2008; Robins, Caspi, & Moffitt, 2002; Simpson, Griskevicius, Kuo, Sung, & Collins, 2012). So the absolutist version of our alternate hypothesis is almost certainly false for some constructs. But the relative rarity of such studies illustrates how challenging it is to separate features of the individual from features of the relationship, and the empirical bar is quite high for any framework that *requires* a clean separation between the two. Rather, we almost always study constructs that reflect a blend of the individual and the relationship: Once a trajectory is airborne, then any piece of the self-concept could be shaped by both relationship-independent (e.g., genes, childhood experiences, lessons learned from past partners) and relationship-linked (e.g., feelings about a current partner or a known potential partner) factors (Hadden et al., 2018). Therefore, any assessment of readiness or desire to form a particular type of relationship is likely to be informed by a given individual's personal history as well as the specific people who have the potential to become relationship partners.

Armed with this knowledge, if we figure out how to conceptualize *and measure* a variable like relationship readiness at both the level of the individual and the level of the dyad, greater theoretical precision and fascinating new research questions will follow. For example, Ann and Chris might not have a romantic/sexual experience together because Ann (i.e., the individual) is not ready (e.g., she is prioritizing partying with her friends; Hadden et al., 2018). It is also possible that Ann and Chris might not have romantic/sexual experience together because the Ann–Chris relationship (i.e., the dyad) is not ready (e.g., they have not yet shared the joint experiences that could reveal their compatibilities). Relationship readiness even has implications for the way we think about relationship variance, that is, the extent to which two people are uniquely compatible with each other, above and beyond their own individual features (Joel, Eastwick, & Finkel, 2017; Kenny, 1994). If readiness can be dyadic, then we can in principle decompose relationship variance into a *bounded* and an *unbounded* component: Two people might be uniquely compatible because of who they are right now in their lives (i.e., both of them are ready for each other right now), and two people might be uniquely compatible at *any* given point during their lives (i.e., both of them have always been, and always will be, ready for each other). As our field gets progressively more adept at studying individuals and relationships over time, the ability to pull apart these different constructs could become an exciting reality.

Functional Systems Are Explanatory, Relationship Length Is Descriptive

Maner (this issue) eloquently argues that differences among romantic and sexual relationships can be explained and understood by identifying the operation of separate evolved functional systems. As he notes, humans possess functionally distinct systems (i.e., sexual behavior, pair-bonding) that serve different evolved goals (i.e., immediate reproduction, bi-parental caring), and these systems can be activated (i.e., turned on) independently and to varying degrees. Viewed

through this lens, the short-term versus long-term length of a relationship is descriptive, or even epiphenomenal, rather than explanatory.

The Dual-Mating Model and ReCAST as Complementary Perspectives

We are enthusiastic about Maner's (this issue) dual-mating model, and it seems to share a number of assumptions with the ReCAST model. Yet there may be a few differences worth highlighting, even if they merely reflect different emphases rather than contrasting points of view. As noted in the target article, ReCAST contains a within-dyad trade-off between mating effort (which predominates in the early portion of the normative trajectory) and parenting effort (which predominates later). Mating effort is a broad category that includes the activation of the sexual behavior system (as articulated by Maner, this issue) but also includes other related systems that facilitate attracting a mate (e.g., systems designed to make a favorable impression). Parenting effort is a broad category that includes systems designed to produce and raise offspring (e.g., systems that govern the protection of children). The pair-bonding system sits at the intersection of mating and parenting effort because it functions to maintain existing relationships (i.e., mating effort) and encourages bi-parental care (i.e., parenting effort). Thus, our distinction (mating vs. parenting effort) and Maner's distinction (sexual vs. pair-bonding systems) are largely compatible, but ours is pitched at a higher level of abstraction.

Generally speaking, we believe that Maner (this issue) is correct in suggesting that "functional systems" carve the human psyche at its natural, evolved joints. However, at this level of abstraction, there are likely to be more than just two functionally independent systems. The caregiving and attachment systems, which are critical components of pair-bonds, can and do function independently to some extent and merit separate consideration (Hazan & Shaver, 1994). Moreover, Clark et al.'s (this issue) three processes—strategic self-presentation, self-protection from rejection, and active evaluation of the partner—could be construed as three additional candidates for functional systems. In the empirical work underlying the ReCAST model (Eastwick et al., 2018), we have assessed approximately 10 such constructs (e.g., self-disclosure, intrasexual competition, and several of the systems described earlier), many of which might merit the functional system label that logically follows from Maner's framework. We collectively will need to build conceptual frameworks that impose theoretical (and perhaps hierarchical) structure on the full set of functional systems.

Even though it is not the goal of Maner's (this issue) approach to explain why relationships are long or short (i.e., the historic emphasis of close relationships researchers), one can refer to the normative sequencing of these functional systems to explain variation in relationship length. Because the sexual system can be activated in an initial encounter, the exclusive activation of this system is likely to be primarily associated with shorter relationships. Because the pair-bonding system typically takes more time to become fully engaged, its activation ought to sustain longer relationships primarily. In other words, Maner (this issue) productively redirects the focus of evolutionary thinking to the underlying functional systems and yet retains the ability to explain why relationships categorized as "short-term" or "long-term" normatively differ.

A primary task of close relationships and evolutionary scholars alike will be to catalog the degree to which myriad individual and relationship-specific forces activate and moderate these functional systems. One possible difference between Maner's (this issue) perspective and ours might be that ReCAST more directly emphasizes the challenge of predicting many of these individual and relationship-specific variables during the early moments or periods of a relationship. Returning to Maner's butterfly analogy, although it is not the goal of all caterpillars (i.e., sexual relationships) to become butterflies (i.e., pair-bonded relationships), the typical butterfly was once a caterpillar, and it is very difficult to predict the fate of a given caterpillar.

Are Categories of Relationships Ever Useful?

By explicitly noting that the short-term versus long-term distinction is descriptive rather than explanatory, Maner (this issue) highlights an intriguing larger issue: Should scholars ever rely on categories of relationships? Why not simply focus on the operation of the multiple underlying functional systems? Indeed, dimensional approaches have greatly informed the (once categorical) approach to personality psychopathology (e.g., Krueger, Hopwood, Wright, & Markon, 2014; Morey, Gunderson, Quigley, & Lyons, 2000), and dimensional models of adult attachment style have largely replaced earlier categorical ones (Fraley, Hudson, Heffernan, & Segal, 2015; Fraley & Waller, 1998). Short-term and long-term categories also seem long overdue for such a makeover.

Certain forms of categorical thinking may remain valuable, however. For example, categories can have heuristic value for scholars early in the research process, and laypeople regularly use them. Consider three of Conley et al.'s (this issue) categories: nonconsensual nonmonogamous relationships (i.e., infidelity), consensual nonmonogamous relationships, and polyamorous relationships. Scholars may need to use these categories—not only when conversing with each other, but when engaging with participants and the general public—because we still do not understand what separates them from one another in terms of underlying psychological features. Once we better understand the psychological dimensions on which these relationships differ (see Conley et al.'s hypotheses), we can work to connect these dimensions to Maner's (this issue) underlying functional systems and reduce our reliance on categorical thinking and labels.

Conley et al.'s (this issue) fourth category—the hookup—reflects a case in which scholars are beginning to make such a transition. As Wade (2017) describes in her in-depth qualitative examination of hookup culture, most hookups take place between friends and acquaintances (not

strangers), which is consistent with the nontrivial period of initial ascent we described in the target article. As for the psychology of the hookup experience, these relationships seem to differ from other young adult sexual relationships in two basic ways, both of which can be illuminated by drawing from the threshold and composition dimensions of the framework. First, hookups tend to be characterized by a threshold for sexual activity that is lower than the threshold for spending (nonsexual) time together. That is, young adults who participate in hookup culture are willing to engage in sexual activity with someone with whom they would not necessarily enjoy hanging out; hanging out would happen further up the arc, following sexual activity (known as "backward dating"; Wade, 2017). Second, people who participate in hookup culture actively downregulate their experience of attachment and caregiving following sexual activity; they are often "suppressing an instinct to be kind" (Wade, 2017, p. 156). The hookup, therefore, may be a good illustration of how a relationship category can, with volumes of descriptive work, become folded into a trajectory framework that represents relationships on continuously distributed, varying constructs.

Diagnostic Situations Promoting Changes in Trajectory Parameters

Our metatheoretical framework does not directly address when, how, or why partners experience changes or shifts in various relationship trajectory parameters. This is where specific theories or models must come into play. However, as Arriaga et al. (this issue) point out, certain types of situations—especially "diagnostic" ones—often may be the contexts in which noteworthy changes or shifts take place in many relationships. Next we clarify how scholars might incorporate diagnostic situations into the study of the full relationship arc.

Diagnostic Situations

Diagnostic situations emerge when partners confronting an important relationship-relevant decision or issue have divergent interests. This can happen when partners disagree about the best or proper course of action to take on an important issue and, accordingly, experience conflict. Some of the specific topics that couples may identify include irreconcilable differences regarding how to deal with or spend time with in-laws, whom to spend time with (or where to go) on major vacations, what to buy when making major purchases, where to live, and whether (or when) to have children. Such situations can expose and clarify the degree to which each partner is willing to set aside his or her own self-interests to promote what is best for the partner and/or the relationship (Holmes & Rempel, 1989; Kelley, 1983; Simpson, 2007). Although these situations can occur anytime during a relationship, they are more likely to take place during transition points when norms or expectations are being formed or are changing, such as when partners are deciding whether to move in together, dramatically increase their level of commitment to each other, get married, have a baby, make major joint purchases or decisions, start/change/leave their jobs, or retire.

How Can Researchers Incorporate Diagnostic Situations into the Trajectory Framework?

In most existing empirical examinations of diagnostic situations, researchers let participants define these "motivation clarifying" events idiosyncratically for themselves, such as prior to a video-recorded laboratory discussion (Shallcross & Simpson, 2012). Researchers studying trajectories could also let participants define these decision points idiosyncratically, either retrospectively or as they occur in real-time. To account for the fact that participants are likely to experience diagnostic situations at different time points, researchers could use discontinuous growth curve models (e.g., Singer & Willett, 2003) to examine how the occurrence of a diagnostic situation impacts the trajectory parameters outlined in our metatheoretical framework.

A variety of patterns are possible. One critical moderator might be the extent to which participants perceive that their partner will (vs. will not) relinquish his or her own self-interests regarding an important issue. For cases in which participants perceive that their partner is unwilling to make sacrifices with respect to the important issue, participants' own trajectory parameters may change (i.e., a Willingness to Sacrifice × Diagnostic Event Occurrence interaction). In terms of shape, for example, participants' satisfaction or commitment might not ascend any further (or might ascend much more gradually), it might not reach a high peak, or it may descend more rapidly over time. With regard to fluctuation, participants may begin to experience more ambivalent thoughts and feelings about their partner, resulting in larger-than-normal evaluative variability in subsequent weeks or months. With regard to density, participants may become more attentive to alternative partners, thereby increasing the likelihood that they would leave the relationship for a new one.

Very different trajectory outcomes, on the other hand, could occur if participants perceive that their partner is willing to make sacrifices in response to diagnostic discussions. In terms of shape, participants' evaluation of their partner might ascend more rapidly than it had previously, eventually reaching a higher peak. With regard to fluctuation, this event might lead participants to experience less variability in their subsequent romantic evaluations. With regard to density, participants may become even less attentive to alternative partners. Finally, with dyadic data in hand, all of these shifts on the part of one partner should affect the other partner's parameters, as well as the synchrony they subsequently experience (Arriaga et al., this issue).

In sum, changes in various trajectory parameters are more likely to occur in response to what happens during diagnostic situations, which can take place any time during the course of a relationship but are more likely to occur at major transition points.

The Relationship Ecosystem

As noted previously, several of the commentaries raise the possibility that trajectories can represent a much broader array of close relationships than the romantic/sexual relationships we depicted. Clark et al. (this issue) note that partners in work relationships, friendships, and family relationships typically have mutual influence on each other. Arriaga et al. (this issue) offer the critical insight that single people may turn to a variety of nonromantic relationships for help in fulfilling their various needs. Conley et al. (this issue) also focus on need fulfillment, observing that there are individual differences in the tendency to meet one's needs through one versus multiple romantic partners. Contemporary Western monogamy norms, in other words, encourage people to find a *generalist* romantic partner who fulfills many or all of their needs, whereas polyamory norms encourage people to find *specialist* romantic partners, each of whom fulfills one or a small subset of their needs (see also Finkel, 2017; Finkel, Hui, Carswell, & Larson, 2014).

In the present section, we consider how scholars can relax certain assumptions of the relationship trajectories framework so it can address these different sorts of relational configurations. As we noted in the target article, we did not include nonromantic or nonsexual relationships because evaluations in such relationships may not be appropriately represented by arc-shaped trajectories, nor is obvious that evaluative constructs such as commitment or satisfaction can be meaningfully compared across romantic and nonromantic relationships. Thus, the relationship trajectories framework is intended to serve as a tool that will aid scholars in addressing questions about sexual and romantic relationships specifically. But we can also relax the assumption that the framework depicts romantic/sexual relationships, and we can relax the assumption that the *y*-axis represents a valenced evaluation and we replace it with a construct that has a similar meaning across different types of relationships—say, need fulfillment (i.e., the extent to which a person fulfills a given need at a given point in time). With these assumptions relaxed, a novel extension of the framework emerges that addresses the issues raised by the commentators. We call this extension of the framework the Relationship Ecosystem Expansion; it captures the full suite of a person's close relationships, both romantic and nonromantic, and it depicts the way in which those relationships unfold over time.

The Fulfillment of Needs through Specialists versus Generalists

Close relationship partners—nonromantic or romantic, monogamous or nonmonogamous—play important roles in helping people fulfill their various needs and goals (Finkel & Eastwick, 2015; Fitzsimons & Fishbach, 2010; Fitzsimons & Shah, 2008; Orehek, Forest, & Barbaro, 2018). Although there are individual differences as well as within-individual fluctuations in which needs and goals are high in motivational priority, we illustrate the relationship ecosystem by focusing on the three broad psychological needs identified by self-determination theory (Ryan & Deci, 2017): (a) *relatedness*, the need to establish social connections characterized by feelings of security, intimacy, and care; (b) *autonomy*, the need to feel like the causal agent behind one's thoughts, priorities, and behaviors; and (c) *competence*, the need to engage with challenges optimally and feel a sense of mastery.

Borrowing ideas from goal systems theory (Kruglanski et al., 2002)—especially its adaptations for understanding close relationships (Finkel & Fitzsimons, in press; Fitzsimons, Finkel, & vanDellen, 2015; Orehek & Forest, 2016) and team dynamics (Fitzsimons, Sackett, & Finkel, 2016)—Figure 1 presents three idealized configurations illustrating how relationship partners can be instrumental to the fulfillment of an individual's needs. The top panel illustrates a *multifinality configuration* in which a given close relationship partner is primarily responsible for helping the individual fulfill multiple needs—as when a romantic partner serves as the primary source of fulfillment of one's needs for relatedness, autonomy, and competence. The middle panel illustrates a *unifinality configuration* in which each of several close relationship partners is primarily responsible for helping the individual fulfill one particular need—as when one partner serves as the primary source of only relatedness fulfillment, another serves as the primary sources of only autonomy fulfillment, and third serves as the primary source of only competence fulfillment. The bottom panel illustrates an *equifinality configuration* in which multiple close relationship partners are partially responsible for helping the individual fulfill one particular need—as when three friends collectively fulfill one's need for relatedness (or autonomy or competence).

The degree to which an individual's relationship ecosystem is best characterized by one of these three configurations, or by any particular blend of them, varies across time. This variation, in turn, has important implications for the degree to which people succeed in fulfilling their needs. Taking inspiration from the commentaries, we illustrate in Figure 2 canonical cases of the three configurations as they could play out over time. The top panel offers a temporal perspective on the multifinal configuration, depicting a plausible representation of Conley et al.'s (this issue) discussion of how relationships develop for people adhering to a monogamy norm. The three graphs in this panel demonstrate that the monogamous partner (solid line) is a generalist, being the primary source of support for need fulfillment across all three needs. The thick gray line in each graph, which represents the individual's summed level of fulfillment of the relevant need across the entire ecosystem, shows that fluctuation over time in the degree to which the partner (a generalist) is helpful regarding need fulfillment is highly correlated across all needs, as when the partner is less responsive than usual due to a stressful work deadline or a case of the flu. In such cases, individuals are likely to experience substantial fluctuation in overall well-being over time, as the circumstances that cause them to endure poor relatedness fulfillment will also cause them to endure poor autonomy and poor competence fulfillment. Consistent with Conley

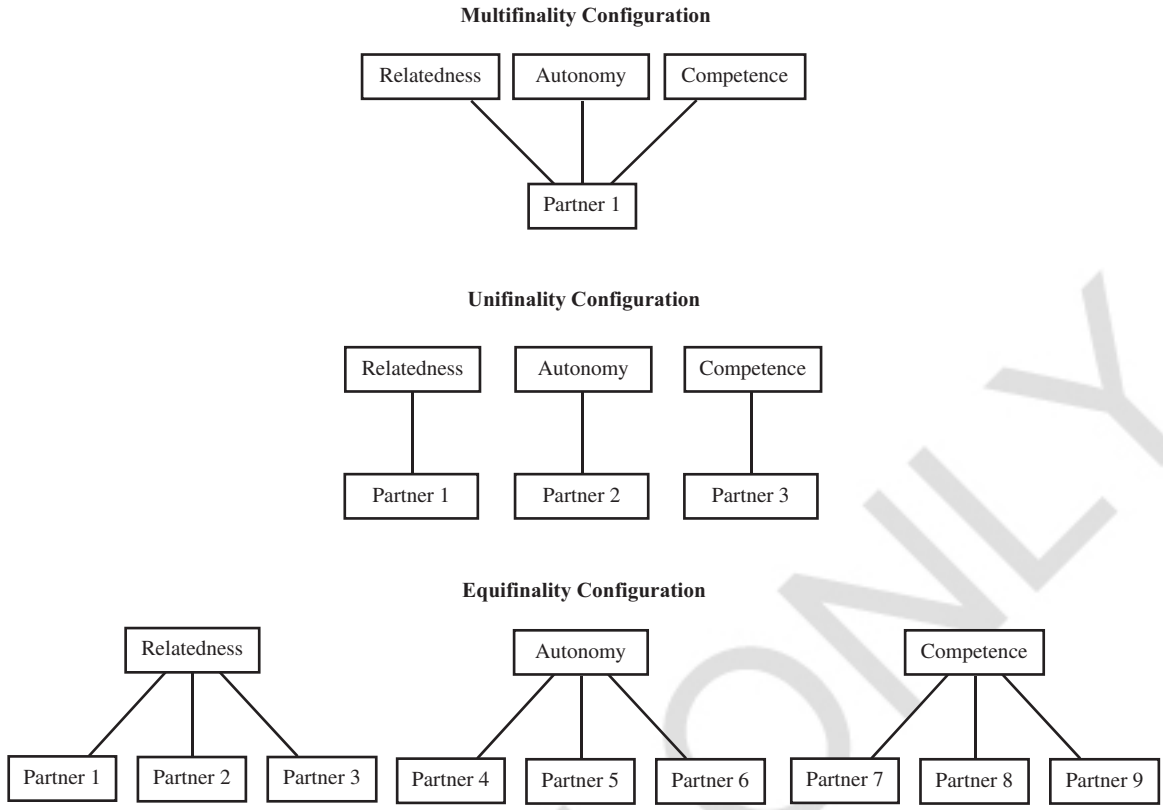

Figure 1. Three idealized configurations illustrating how close relationship partners can be instrumental for the fulfillment of relatedness, autonomy, and competence needs.

et al.'s (this issue) observation that one relationship typically starts to disintegrate before the next one begins among people adhering to a monogamy norm, the three graphs also illustrate the increasing importance of a new relationship partner (dashed line), whom the individual began looking to for need fulfillment around the time that the original relationship (solid line) began to deteriorate.

The middle panel in Figure 2 offers a temporal perspective on the unifinal configuration, depicting a plausible representation of Conley et al.'s (this issue) discussion of how relationships develop over time among people adhering to a polyamory norm. The three graphs in this panel demonstrate that each partner (represented by a solid vs. a dashed vs. a dotted line) is a specialist, serving as the primary source of support for need fulfillment for one and only one need. In this representation, fluctuation over time in the degree to which one partner is helpful with the fulfillment of the relevant need is largely uncorrelated with fluctuation over time in the degree to which either of the other partners is helpful regarding the fulfillment of the other needs. If the partner who is especially helpful with relatedness fulfillment is less responsive than usual due to a stressful work deadline, the degree to which the other partners are helpful with autonomy fulfillment or competence fulfillment may be unaffected. Relative to individuals represented in the top panel (who adhere to a canonical monogamy norm), individuals represented in the middle panel (who adhere to a canonical polyamory norm) are more likely to experience lower need fulfillment of at least *one need* at any point in time because the odds that at least one of their partners will be indisposed at a given point in time is higher than the odds that one particular partner will be indisposed. But, by the same logic, they are less likely to experience low need fulfillment across *all needs* at any point in time because it is unlikely that the circumstances indisposing one partner will also indispose the others. The graphs in the middle panel illustrate this point by representing the degree to which the specialized partner fulfills the relevant need with lines (solid for relatedness, dashed for autonomy, dotted for competence) that are out of phase and have different wavelengths.

The bottom panel in Figure 2 offers a temporal perspective on the equifinal configuration, depicting a plausible representation of a relationship ecosystem for individuals who look to multiple close relationship partners to fulfill each need, with no particular partner playing a primary role. Such an ecosystem might reflect people who are not pursuing a romantic partner (i.e., singles; see Arriaga et al., this issue) but are instead electing to maintain an array of nonromantic relationship partners, each of whom plays a notable but not a primary role in helping the individual meet one of her fundamental needs.[1] As with individuals whose relationship ecosystem approximates that depicted in the middle panel, fluctuations over time in the fulfillment of a given need are unlikely to be strongly linked to fluctuations over time in the fulfillment of the other needs because

[1]It could also represent people, for example, who (a) ascribe a role for their romantic partner that is commensurate, in need-fulfillment terms, with the roles they ascribe to their friends, or (b) have a collection of romantic partners, all of whom perform similarly circumscribed roles.

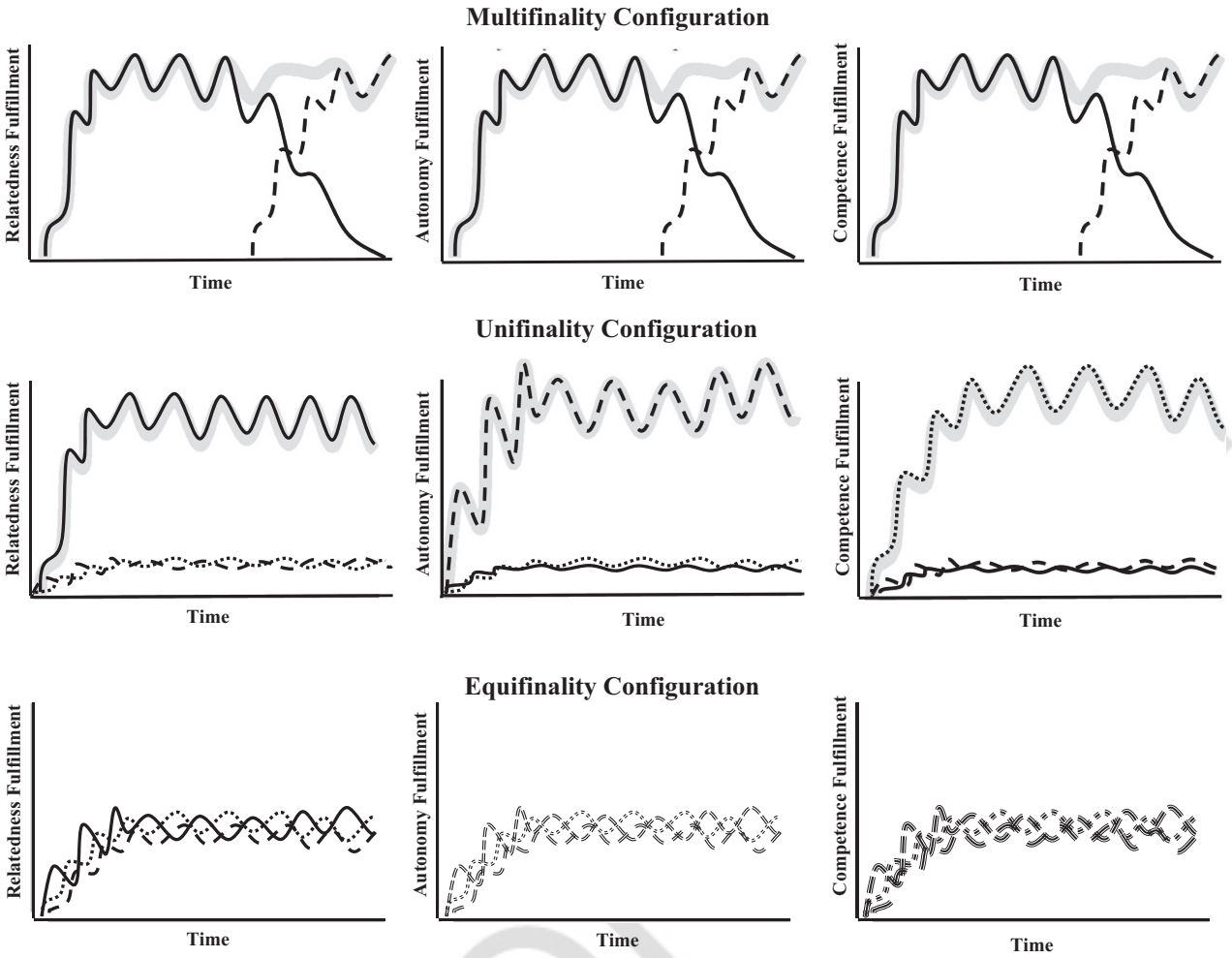

Figure 2. Three idealized configurations from Figure 1, as depicted over time. *Note.* Different lines within a row represent different partners (multifinality: two partners total; unifinality: three partners total; equifinality: nine partners total). The gray line represents summed need fulfillment across all partners.

different relationship partners are instrumental for the fulfillment of different needs. In contrast to individuals whose relationship ecosystem approximates that depicted in the middle panel, however, individuals whose relationship ecosystem approximates that depicted in the bottom panel are also less susceptible to fluctuation over time in the fulfillment of *any particular need*. Whereas the unifinal configuration is associated with relatively high fluctuation over time in the fulfillment of a particular need as a function of variation in the specialist's availability, the equifinal configuration is associated with relatively low fluctuation because several different relationship partners contribute to the fulfillment of that need.

Future Extensions of the Ecosystem

In short, the relationship ecosystem expansion takes the relationship trajectories framework and extends it to incorporate all close relationships—not just romantic and sexual ones. Because it touches on major research questions that stretch far beyond our current knowledge base, this perspective may serve as a first step toward an ambitious new research agenda for the discipline.[1]

If relationship scientists pursue such an agenda, we will need to consider some simplifying assumptions and omissions. First, the present discussion sidesteps several key dimensions of the framework. Figure 2 incorporates fluctuation and density, but thresholds may also be critical, such as when people vary in how much relatedness they desire at a given point in time. Second, the present discussion neglects the fact that people differ, both from one another and over time, in the extent to which they are fulfilling a given need on their own (e.g., fulfilling their need for competence by completing a work project), which may alter how much help they require from others to fulfill it. Third, the present discussion does not address individual or time-varying differences in the constellation of specific needs or goals under consideration. One relevant issue is that needs and goals can be assessed at relatively high (*be a responsible person*), moderate (*return that thing I borrowed*), or low (*turn the steering wheel clockwise*) levels of abstraction (Carver & Scheier, 1982). Our discussion has focused on needs at a high level of abstraction—autonomy, competence, and relatedness—but Conley et al. (this issue) are correct in noting that people vary in the degree to which they seek to meet particular *elements* of their relatedness needs through one generalist partner versus a set of specialist partners.

For research investigating these topics, *relatedness* is too abstract; at minimum, researchers will need to distinguish between *romance* and *intimacy*. Of course, this lower level of abstraction will remain too high for some research questions, such as when Diamond (2003) divided *romance* into the subcomponents of *romantic love* and *sexual desire*.

Finally, the present discussion does not consider dyad-level properties or phenomena rigorously (e.g., the *z*-axis as discussed in the target article). Efforts in that direction become massively more complicated when we incorporate multiple relationship partners and multiple needs and goals. As we glance into the future, perhaps relationship scientists may be able to develop and test compelling theories of how an individual's need-fulfillment trajectories are linked to the need-fulfillment trajectories of each member of his or her social network. Ideally, such theories will also recognize that each of those members is also embedded in broader social networks that contain individuals whose fulfillment trajectories are, in turn, complexly interdependent with others' trajectories, and so on. Successful efforts along these lines would help us integrate the literatures on relationship science, self-regulation, and social networks.

Conclusion

In conclusion, we are honored that these scholars took the time to consider how the relationships trajectories framework could be used to address their own research questions; it has been enjoyable and challenging to immerse ourselves in the issues and ideas that they have raised. As relationship scientists continue to chart the time course of relationships, we hope that the relationship trajectories framework (and, too, the Relationship Ecosystem Expansion) will provide a common structure for close relationships and evolutionary psychologists alike. There will surely be disagreements and controversies about the way in which relationships operate and function, but at least we will share the assumption that the whole relationship must be studied over time. We need to understand the origin of these trajectories, and we should follow them wherever they lead.

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