Metamorphoses of Love

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The Essential Economics of Love

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1. *Introduction - The mystery of love*

Perhaps it is not a shocking revelation that economists know very little about love, in the scholarly sense. For one thing, economics is just not that old of a discipline. Moreover, until the 1960s, economists stuck to their knitting, emphasizing analysis of explicitly monetary decisions (trade, work, income, etc.). Starting in the 1960s, with the work of Gary Becker (1965), economists (and others) were awakened to the possibility that the discipline could usefully focus its attention on subjects not traditionally 'economic', such as crime, discrimination, voting, and the incentives of politicians. As well, at this time, economists (led by Becker (1973, 1974)) turned to analysis of the family – marriage, divorce, children. Yet, while this work has grown and developed dramatically, a gaping lacuna remains (largely) when it comes to love.

Hence, it is the task of this paper to make an intellectual match, as it were – to introduce economists to love. Like any would-be match, the exercise is fraught with peril. Are economics and love compatible? Can an enduring connection be forged? I argue that economics and love are well-suited for each other, although building a relationship will take some work, due both to the methodological demands of economic thought and the general intellectual challenge of understanding love[1]. In making this argument, I necessarily start, in section 2, with a review of the limited economic literature on love, followed in section 3 with a consideration of just how

[1] Perhaps it is fair to say that understanding love poses a considerable challenge in other disciplines, too.

economists can (and should) think about how love arises, in a conceptual sense. Section 4 than considers refinements and elaborations of this, addressing requited and unrequited love, and how love is (in the economist's sense) consumed. With this fuller depiction of love, attention is turned to love problems in section 5, where it is seen that producing and consuming love is, to some extent, a doomed enterprise. Section 6 offers concluding comments, and proposes that 'love economics' is here to stay.

2. *The (small) previous economic literature on love*

As noted, economics has not had much to say about love. An EconLit search for the subject "love" turned up only about 10 substantive discussions of the issue, many of which are quite brief. Almost all of this literature treats love instrumentally, deducing its implications for marital matching (Becker, 1996; Hess, 2004), economic growth (Zak and Park, 2002), and a few other outcomes. Becker (1996) generates the somewhat counterintuitive result that the presence of love within marriage makes it more likely that, within marriage, men and women will be positively correlated in terms of how desirable they are, rather than matching in terms of corresponding strengths and weaknesses (e.g., when career-oriented and child-raising-oriented spouses mutually benefit from marrying one another). Becker's discussion, however, does not address how love arises, and furthermore relies on an extremely specific notion of love (i.e., altruism such that marital 'income' is equalized between spouses). A somewhat more explicit but related analysis is provided by Hess (2004), who investigates how the presence of love influences the propensity of spouses to use marriage as an insurance policy to protect against individual job loss (in general, to protect against low income). Essentially, the more important (and persisting) that love is, the more willing people are to form marriages that provide less effective 'income insurance'. Hess finds, however, in analysis of data on marital persistence, that marriages in which spouses provide ineffective insurance for one another are less likely to survive, implying that love is relatively unimportant in marital persistence. Like Becker, however, Hess also treats love as arising by some random process, and does not consider how love might be cultivated. Other papers, such as Engineer and Welling (1999), also assume that love arises randomly, and consider whether affirmative action policies might induce better matches (where 'better' matches are those that enable greater total value in mar-

riage, excluding the value of love). As well, the reasoning of these papers is extended more broadly to consider the impact of love on the macroeconomy and its rate of growth. Two papers looking at love and growth are those by Zak and Park (2002) and Thibault (2004). Each paper finds that models which incorporate love predict greater economic growth, albeit for different reasons: spousal love increases genetic diversity for Zak and Park, while Thibault shows that parental love for children ensures that macroeconomic collapse is averted.

A much more developed account of love, somewhat in the spirit of this paper, is found in the 2001 book *Love and Economics: Why the Laissez-faire Family Doesn't Work* (Morse, 2001). Morse's book, unlike the other literature described above, considers the nature of love in a far more essential way, although her approach is more reliant on moral philosophy than on economics *per se*. Specifically, Morse provides an essential definition of love borrowed from St. Thomas Aquinas: «To love is to will and do the good of another». For Morse, both 'willing' and 'doing' entail costs and benefits, and she depicts both givers and receivers of love as rational choosers who thereby compare costs and benefits. Thus, she is led to claim that love is an economic good (a point which I develop in section 3), although there are some limits in buying and selling love (a point to which I return in sections 4 and 5).

3. *Invisible widgets: love as a household commodity*

A fundamental issue that love economics must first address is what love is, conceptually. To an economist, all things can be classified as good (one's favorite food), bad (a noxious smell), or neutral (old newspapers written in a language that one doesn't know and doesn't care to know). (Implicit in this is the idea that these classifications are subjective: one man's sublime wine may be another's mediocre mouthwash and yet another's repellent swill.) Within this taxonomy, love can be regarded as an economic 'good'[2].

Love, however, cannot be directly purchased in the same way coffee or legal services can be obtained. Indeed, love by its nature arises from a set of human actions (meeting, speaking, listening, assisting, etc.) combined with physical objects (food, books, jewelry, etc.). In this sense, love fits the

[2] As well, it is possible to develop a notion of how love can transmute from 'good' to 'bad'.

economist's definition of a household commodity, a construct developed by Becker to represent more accurately the actions undertaken by people outside of working at paid jobs. Essentially, Becker's idea is that one doesn't purchase electricity or garlic for their intrinsic merit, but rather for their productive use (along with other 'inputs') in cooking the household commodity 'pasta primavera'. Love, analogously, is produced, too, by combining the time of Mercurio and Lucia along with other inputs (e.g., books, flowers, music). Contemplating *how* love is produced, however, requires greater reflection upon the essential nature of this commodity.

3.1. *Purposive production (basic household production model for single commodity)*

One possibility is that love is really no different than pasta primavera in that a couple purposively musters its resources (time and physical goods) to produce a quantity of love that it desires. As such, love is one among many (often mutually exclusive) goals – more time and money spent on producing love leaves less money for Mercurio to spend on wine, meaning that he purchases fewer bottles or bottles of lower quality or both. This framework implies that love, like most (all?) commodities is consumed in moderation, and that at a certain point, spending more time and money on love contributes less to the happiness of Mercurio and Lucia than spending that time and money on repairing windows in their home, for example. Hence, Mercurio and Lucia produce and consume the optimal quantity of love, along with the optimal quantities of pasta primavera, window repair, dental care, sleep, etc. In choosing these various optimal quantities, we say that they 'maximize utility', where utility is an overall (subjective) measure of how happy they are.

3.2. *Indirect production (joint production of love with other household commodities)*

This foregoing idea of love, as a single household commodity that is purposively produced, may be problematic. One concern is that love is not produced separately, but is instead a byproduct of other household production processes. (The issue of purposiveness will be taken up below in subsection 3.3.) So, for example, the quantity of love produced by Mercurio and Lucia arises from their success (or lack thereof) at producing other commodities. Because household commodities encompass the entire scope

of marital activity (sleep, sex, conversation, pasta, financial planning, auto repair, bathroom cleanliness, etc.), it is possible that love arises as a byproduct of some but not all of these processes. For example, financial planning or bathroom cleanliness might not be jointly produced with love; this would be the case if participating in financial planning (or bathroom cleaning) had no influence on the extent of love enjoyed by Mercurio and Lucia. The quantity of love they produce would, however, depend on the quantities they produce of love-relevant commodities such as sleep, sex, conversation, pasta (perhaps), and a multitude of others. Economists refer to this phenomenon as 'joint production'; a mundane example outside the family would be cow leather being jointly produced along with beef. The more leather that is produced, the more beef that jointly results. Under this interpretation, if a couple produced more of one, some, or all of these love-relevant commodities, their quantity of love would effectively increase.

3.3. *Inadvertent production (residual from other household production processes)*

An objection to both the 'purposive' and 'indirect' production theories of love is that each depicts love as being deliberately chosen in a specific quantity. It is possible, however, that love's ineffability implies that a less exacting model of production is relevant. One objection (which I will argue against) is that economic rationality does not apply to love at all. Another objection (which I will attempt to take into account) is that love is not produced directly or indirectly but rather, inadvertently.

The first objection is a fundamental rebuke to the approach taken in this paper. This objection views love as outside the scope of economic analysis. Among the claims presumably underlying the objection are: (i) love cannot be explicitly measured, and (ii) people do not make systematic decisions about love. Each of these concerns can be briefly considered in turn. It is inarguable that love cannot be objectively quantified in the same way that tomatoes can. Some critics might even argue that love is only measured on a binary scale (either in love, or not in love) and that it is meaningless to consider quantitative distinctions (degrees of love). I will claim, however, that love is indeed measured in degrees, and trust that non-economists will not be offended by this. This characterization is surely supported both by classical reference to 'great' loves in contrast to 'ordinary' loves, and by observation that few (if any) people would state that they love different potential spouses equally.

Claim (ii) underlying this first objection – that people are not economically rational when it comes to love – is a common complaint aimed at economic analysis of many non-monetary topics (e.g., marriage, punishment of criminals, racial preferences). The essence of this complaint is that it is inappropriate to characterize choices that *do not* principally focus on the exchange of money with the same analytical lens as is used to characterize choices which *do* principally focus on money (a firm's product development, the trading of securities, corporate bankruptcy). Economics does not apply to these non-monetary issues, it is alleged, because people do not calculate and act in regard to self-interest in non-monetary matters. Such an essentially-based objection is difficult to counter directly. One might propose to survey people as to whether they place a value on love. However, economists are by nature skeptical of individuals' direct statements regarding their attitudes (as would be ascertained through a survey) and place far greater weight on what people actually do (so-called "revealed preference"). Indeed, a famous commentary on economic methodology by Milton Friedman (1953) proposes that the only meaningful way to evaluate underlying assumptions (such as: people place a value on love) is by empirical testing of the hypotheses that these assumptions generate. In fact, Friedman argued, even if people do not consciously calculate (e.g., how much more favorable one lover is compared to another), the assumption of rationality is supported as long as people act "as if" they are making such calculations. The success of economic analysis in many areas is thus demonstrated by empirical support for economic hypotheses; of course, in the absence of data on love, substantiating the economic theory of love is more difficult. Hence, for the time being, the idea that economics is properly applied to love will have to remain an assertion (albeit one for which there's intriguing anecdotal evidence)[3].

Accepting this assertion, it is still reasonable to quibble with the first two models of love production posed (direct production, indirect production). Both of these models require that lovers have a systematic understanding of how to produce love. Specifically, both models involve the idea that the choice by either spouse (say, Mercurio) of how much time to spend on specific activities ('love' itself in the direct model, other activities with

[3] Charles Darwin, for example, composed a document (Darwin, 1838) to help him determine whether or not to get married, listing benefits («picture to yourself a nice soft wife on a sofa with good fire, & books & music perhaps») and costs («fatness & idleness», in «Anxiety & responsibility»).

'love byproducts' in the indirect model) is associated, in his mind, with the additional love that will result from his time allocation choice. It may be more realistic, however, to imagine that love arises in a less systematic way from the choices of Mercurio and Lucia.

Love is commonly described as 'mysterious'. This element of 'mystery' can be captured in an economic model by considering the production of love to be subject to a fundamental uncertainty. Imagine (as economists do) that couples produce a multitude of specific household commodities: pasta primavera, conversation, bathroom cleanliness, sleep, sex, etc. It is perhaps realistic that love arises (is produced) in a 'mysterious' way from the production of these other, often quotidian, commodities. The element of 'mystery', however, is what differentiates this third model from the indirect (or joint) production model previously discussed.

In the indirect production model, love was systematically chosen as a byproduct of all other household commodities. Thus, in selecting how much time to devote to conversation with Lucia, Mercurio would envision not just how much additional conversation would be produced[4], but also the additional quantity of love that would be produced. So, in deciding how much more time to devote to conversation, he would consider the *total* benefit – the benefit from the additional conversation itself plus the benefit from the additional love. The reasonable objection to this model, however, is that it requires Mercurio and Lucia to know quite specifically how love is produced.

Knowing specifically how to produce love, however, runs counter to the idea that love is mysterious. Hence, a modified model embodying 'mystery' is required. The notion of 'mystery' can, for our purposes, be represented by the economic/statistical concept of randomness or uncertainty. Within this framework, Mercurio and Lucia each choose how much time to spend in the production of each of the multitudinous set of commodities they care about: pasta primavera, conversation, bathroom cleanliness, sleep, sex, etc. They discover, however, that their production of each of these commodities is either more or less than anticipated. Some of this reflects the ordinary physical uncertainty of production (e.g., How well will this particular pasta recipe work?), but some of this reflects a prior unknowability pertaining to the specific interaction of Mercurio and Lucia (e.g., How fulfilling will it be to discuss 'honesty', say, over dinner?). This

[4] This addition to conversation would be characterized both by its quantity (30 more minutes) and its quality (the sophistication of the topics, for example).

second form of uncertainty is arguably the mechanism through which love is produced. Specifically, imagine that for each household commodity Mercurio and Lucia produce there is a quantum of this second (relationship-specific) uncertainty. So, if we refer to the quantity-quality of pasta primavera as X_1 and the quantity-quality of conversation as X_2, we can imagine that each of these contains an element that was not expected and that is associated with the interaction between Mercurio and Lucia. Call these elements l_1 and l_2, respectively. In a mathematical sense, l_1 and l_2 are random variables, meaning that Mercurio and Lucia know on average how large they will be but that there is variation around that average. These individual l values can be positive or negative numbers (for, respectively, unexpectedly productive or unexpectedly disastrous collaborations). Taken together, for all of the household commodities (N in number) that they produce, they define the quantity of love, denoted L, that the couple experiences[5].

Hence, more love, and larger L values are experienced by couples who have better experiences in producing household output together. Whether couples have better or worse experiences is attributable to the mystery of love. This mystery derives from two forms of luck: (i) episodic luck, and (ii) compatibility luck. Episodic luck refers to the size of individual l values – i.e., a couple cannot know in advance how well their production of a particular commodity will go. Good luck, in an episodic sense, would mean a larger positive value of l for a specific household commodity (e.g., travel to Italy). So, Mercurio and Lucia could experience an unexpectedly large value of l pertaining to a particular commodity (travel to Italy) but also an unexpectedly small value (or even a negative one) for the l pertaining to a different commodity (child-raising). Compatibility luck, on the other hand, reflects the idea that some couples tend to have better or worse l values – across all household commodities – than other couples, owing to their good or bad fortune in being together. The element of luck here is not whether a particular commodity will turn out well (a trip to Italy), but whether one has good fortune in meeting a compatible person with whom l will tend to be higher for all commodities that are produced.

[5] So, the size of L comes from a general mathematical function f in which $L = f(l_1, l_2, \ldots, l_N)$, where N is the number of distinct household commodities: pasta primavera, conversation, bathroom cleanliness, sleep, sex, etc.

4. *What kind of good is love?*

The preceding discussion of how love might be produced, while useful in establishing a foundation for analysis, has neglected a few related issues pertaining to how love is produced and consumed. One unaddressed concern is whether the production process necessarily involves two people. Indeed, love can be conceived as either requited or unrequited, with the foregoing analysis focusing on requited love. Hence, consideration of unrequited love is warranted. As well, the manner in which love is consumed is also of interest. Specifically, economists conceive of goods as being either private or public, where a private good is something exclusively consumed by one person (the specific glass of *vino bianco* consumed by Mercurio cannot also be consumed by Lucia), while a public good is something nonexclusively consumed (the temperature in Mercurio and Lucia's home of, say, 20 degrees Celsius, can be (must be) consumed by Mercurio to the same extent as it is consumed by Lucia.

4.1. *Requited and unrequited love*

Sometimes love is not reciprocated; indeed, many arias and poems lament just this. The discussion of love to this point has tacitly assumed that this is not an issue. Hence, the analysis in section 3 depicted love as produced, perhaps inadvertently, by dint of effort by two people. While this form of love (reciprocated/requited/bilateral) is surely important, there is also conceivably another form of love (unreciprocated/unrequited/unilateral) which also is commonplace and worth brief consideration.

In the broadest qualitative sense, unrequited love can be viewed as a household commodity like requited love. An important distinction between unrequited and requited love would, however, be that unrequited love is produced using the time input of only one person ("the lover", but not "the love object"), while requited love would involve time inputs from *two* people ("lover" *and* "love object"). A further distinction might involve the mode by which unrequited love is produced. In section 3, I argued that requited love might not be produced purposively, but rather that it would arise inadvertently from the other activities (i.e., household commodities) that constitute companiate life. By contrast, unrequited love might more appropriately be conceived as purposively produced, in much the same way that an individual is obsessed with a sports team. Or, given that there are two players (in a game-theoretic sense), "lover" and "love object", it

may be useful to depict unrequited love as the equilibrium of a non-cooperative game in which the "lover" chooses to love and the "love object" chooses to spurn. In this sense, requited love would be conceptually distinct in that it would sometimes arise from cooperation between the two parties, although non-cooperation is certainly possible, the implications of which are discussed in section 5.

4.2. *Love as private good and public good*

A somewhat related issue is whether love is construable as a private good or a public good. As noted above, private goods are those involving exclusive consumption (my consumption of a particular glass of *vino bianco* precludes your consumption of that same glass), whereas public goods involve simultaneous consumption by multiple people (e.g., the temperature of a room). Either conception of love (private-good or public-good) is plausible. If love is a private good, then Mercurio could choose to 'give' more love to Lucia while consuming less himself. An example of this would be where Mercurio effectively gives love to Lucia by devoting time to an activity she likes but he dislikes (e.g., shopping for shoes). Alternatively, love is a public good if it is a shared experience of common sentiment, i.e., something invariably amorphous that resides neither in one person nor the other, but transcends the two people. This notion is expressed, in a sense, by the observation of Saint-Exupery that «love does not consist of gazing at each other, but in looking together in the same direction» (Saint-Exupery, 1940). Both the private-good and public-good depictions seem pertinent to thinking about love, suggesting that love perhaps has both components. Nevertheless, it is tempting to think that the public-good component constitutes a substantial fraction of requited, marital love. The importance of this public-private distinction will be explored further in section 5.

5. *Problems intrinsic to producing and consuming love*

The idea that love is fraught with peril is commonplace in non-economic treatments of the subject. So, it is appropriate that love also poses considerable problems when considered through the lens of economics. At least four special love problems can be identified, which are discussed in the four subsections below.

5.1. *Labor-intensivity*

One problematic aspect of the production of love is that it is undoubtedly time-consuming. Suppose that love is produced as an inadvertent (somewhat random) byproduct of many other household production processes, as discussed in section 2. Recall that these random byproducts were denoted as $(l_1,l_2,\ldots,l_N)$, corresponding to the N household commodities $(X_1,X_2,\ldots,X_N)$ produced by Mercurio and Lucia. In choosing how much time to devote to each of these household activities (pasta primavera, conversation, bathroom cleanliness, sleep, sex, etc.), Mercurio and Lucia have an idea, on average, of how large the l values associated with each commodity will be. Presumably, the average l values for some of these commodities are much larger than those for other commodities. That is, some of these activities are probably more central to the (inadvertent) production of love than others. Examples of more 'central' activities might include conversation, child-raising, and sex, while other less 'central' activities might be bathroom-cleaning, bill-paying, and painting walls.

In principle, a particular quantity of any of these household commodities can be produced using a variety of combinations of the two types of inputs: spousal time, and 'goods'. For example, painting the walls in one's home is accomplished with inputs of spousal time, paint, brushes, and, potentially, the time of hired house-painters. So, among the 'goods' used is 'hired house-painter time'. One doesn't need economics to understand that couples can substitute between using their own time and using 'hired house-painter time' in the production of 'wall-painting'. The extent to which this substitution occurs depends on two factors: the skill of Mercurio and Lucia in painting relative to that of a hired painter, and the effective cost of Mercurio and Lucia's time. This time cost is captured by what Mercurio and Lucia would forgo by spending time painting. Concretely, this time cost is represented by their wage rates, i.e., how much money each could earn per hour at a paid job. So, if Mercurio's wage rate is 35 euros, the implicit cost for him to paint for one hour is 35 euros.

'More central' (e.g., conversation) and 'less central' (e.g., painting) household commodities are distinguished by how readily 'hired' time can be substituted for spousal time. Specifically, imagine that the 'more central' commodities permit a smaller potential for time substitution than do the 'less central' commodities. For example, while a house painter can do essentially the same thing that Mercurio could do (in terms of wall painting), a hired conversationalist would presumably be far less productive in

making conversation with Lucia than Mercurio himself is. Hence, the hired conversationalist would not be expected to produce an l value of any size that could contribute to Mercurio and Lucia's production of love. This is because the l value from conversation is highly specific to Mercurio's participation in that activity. In other words, his allocation of time to conversation is much more crucial to producing love than is his allocation of time to house-painting.

Consequently, as their wages rise, it becomes more and more costly for Mercurio and Lucia to engage in these 'more central' activities. They respond to this rising cost, therefore, by engaging in less of this activity[6]. So, as their wages rise, they have a tendency to shift more and more time away from 'more central' activities and towards paid work at their jobs. Herein lies the problem: as societies develop, and wages inevitably rise over time, the cost of love also rises. Hence, economic growth may be antithetical to the fostering of love[7,8].

5.2. *Monopoly power*

Another special problem associated with the production of love is that it is produced under monopolistic conditions. To be precise, in their marriage, Mercurio is the only supplier of his own time, while Lucia is the only supplier of her own time. Each has monopoly power with respect to the other[9]. Once they have selected each other, each can effectively charge a premium price for providing time to household production, and potentially succeed in getting the other person to 'pay' this price. This ability to act as a monopolist arises from the uniqueness of the input provided by each spouse. So, Mercurio, by definition, is the only supplier of 'Mercurio-ness', and analogously for Lucia. Additionally, and related to this, obtaining substitute time from another supplier is very costly: while Lucia could in principle hire Orso to spend time conversing with her, this might be less pro-

[6] It is important, however, to note that rising wages also increase the demand for conversation (along with other household commodities) on the part of Mercurio and Lucia, pushing them in the direction of devoting *more* time to conversation.

[7] Again, the qualification in the preceding footnote should be taken to heart.

[8] A version of this idea is found in Folbre (2001).

[9] This is not the same as saying that the marriage *market* itself is subject to monopoly problems. The marriage market refers to the mechanism by which people meet and get to know one another. This is routinely viewed as involving large numbers of potential mates from which Mercurio and Lucia selected each other, and because of the large numbers of alternatives, no one individual can exercise monopoly power with regard to the decision to get married.

ductive for her for a number of reasons. Among these reasons are that Orso does not know as much about Lucia as Mercurio does, or that Mercurio penalizes Lucia for hiring Orso.

The existence of monopoly power creates a problem in regard to the amount of love produced and consumed. The problem arises because both Mercurio and Lucia are aware of their individual uniqueness and hence, the fact that each possess monopoly power with regard to the other. As a result, each is inclined to get the other to 'pay' more in return for exerting effort to produce output. This mutual desire to extract monopoly prices from one another leads, naturally, to conflict. Specifically, Mercurio and Lucia bargain with each other over how to divide up the household output that they produce, and also bargain over how much effort each will devote to particular forms of household production. As an illustration, think of Mercurio and Lucia as bargaining over the production of a household commodity that benefits Mercurio and is produced by Lucia's efforts alone: listening sympathetically and knowingly to Mercurio's neurotic laments. Lucia provides listening that is unique (different than that provided by Mercurio's psychiatrist or his bartender), and knows therefore that she can charge a monopolistic price to Mercurio. (Imagine that this price is paid in terms of how much time Mercurio spends looking at online pictures of shoes, a household commodity that benefits Lucia alone). In response, Mercurio requests less of this service than he would if he were charged a lower (non-monopolistic) price. Moreover, Mercurio purchases an amount that is less than is socially desirable – the amount he would purchase if Lucia charged him the non-monopoly price corresponding to her cost of production.

This, then, has implications for the amount of love produced. Specifically, we are conceiving of love as being produced inadvertently as a byproduct of the other multitudinous household production processes, including listening. Because of each person's awareness that the other will be prone to exploit the other monopolistically, we determined that the amount of listening will be less than if monopoly exploitation did not occur, which is also less than the socially desirable amount of listening. Because less listening is produced and consumed than is socially desirable, the l value associated with the production of listening will also be smaller than is socially desirable. More broadly, for every household commodity where monopoly exploitation is possible, too little output is produced, and hence the corresponding l value is smaller than is socially desirable. The overall effect of this is for the quantity of love that is produced to be smaller than is socially desirable.

5.3. *Free-riding*

Another intrinsic problem associated with love arises from the fact that many commodities produced within marriage, including love itself, are public goods. Suppose, say, that Mercurio and Lucia have a son, Emilio. Emilio's life is characterized by a number of qualitative elements: his health, school performance, career success, and general happiness. These qualitative elements are, effectively, public goods for Mercurio and Lucia – the idea of Emilio receiving good grades is something that both spouses can enjoy simultaneously. Mercurio's consumption of Emilio's grades does not exclude or impair Lucia's consumption of his grades. Because of this, there is a tendency for each spouse to 'free-ride', i.e., to enjoy the benefits of the public good without contributing much to its production. So, Mercurio reasons that he can enjoy Emilio's success even if he doesn't help Emilio with his mathematics homework – Lucia will help him. This is rational for Mercurio in that time spent helping Emilio takes away time that Mercurio could spend writing important academic papers or watching television. Because Emilio's grades are a public good, Mercurio can benefit from this without contributing to producing it. For her part, Lucia has an analogous motivation: have Mercurio help Emilio while she sleeps or takes a bath.

The basic problem is that neither Mercurio nor Lucia will necessarily take account of the benefits received by the other. Mercurio will spend another hour helping Emilio if the benefit *to Mercurio* exceeds the opportunity cost to him of missing an hour of television. But, the benefit to society associated with Mercurio's hour of help for Emilio is larger than Mercurio's benefit: it is Mercurio's benefit *plus* Lucia's benefit. In general, Mercurio will fail to take full account of the benefits received by Lucia, and thus will provide too little help to Emilio. Moreover, Lucia is subject to the same motivation. Both spouses free-ride, and therefore devote too little effort to the production of any household commodity that is a public good.

This has implications for the amount of love they produce. Recall that we are imagining love to be produced inadvertently as a byproduct of producing some (many?) household commodities. Free-riding means that each spouse devotes less effort to the production of any household commodity that is a public good (within the marriage). It is plausible that many household commodities – e.g., children, home decorating, conversation, cleaning, financial management, etc. – are indeed public goods within marriage, in that they are equally consumed by each spouse. Hence, there is ar-

guably a lot of free-riding going on within some (many?) marriages. Such free-riding involves each spouse devoting too little effort to these various public-good household commodities. Because, for example, less conversation is produced and consumed than is socially desirable, the *l* value associated with the production of conversation will also be smaller than is socially desirable. More broadly, for every household commodity where free-riding occurs, too little output is produced, and hence the corresponding *l* value is smaller than is desirable. The overall effect of this is for the quantity of love that is produced to be smaller than is socially desirable.

5.4. *Zelder Paradox*

The issue of public goods also presents a more fundamental problem surrounding the production of love – specifically, that the production of a greater amount of love could actually, paradoxically, make relationships more likely to dissolve, even though they should not. This idea, which we can call the Zelder Paradox, comes from two papers on no-fault divorce by Zelder (1993a, 1993b)[10]. In those papers, Zelder identified an intrinsic economic problem with relationships, namely, that they often derive much of their value from public goods (such as children, home decorating, conversation, cleaning, financial management, and a host of other things). This dependence on public goods becomes a problem if relationships can be ended unilaterally, as under no-fault divorce laws. With the possibility of unilateral exit by Lucia, for example, Mercurio must then attempt to induce her to remain with him by making her happier within their marriage. He does this, in principle, by transferring goods and services to her within marriage. To be concrete, he might agree to be more pleasant to her, to spend less money on himself and have her spend more on herself, and to perform household chores in her stead. All of these are examples of private goods – things that Lucia can consume more of as long as Mercurio consumes less of them.

Specifically, Mercurio examines his situation, and evaluates how much happier he is being married to Lucia than he would be otherwise (single, or instead married to Sordina). The extent to which Mercurio prefers his continued marriage to Lucia (relative to his next-best alternative – Sordina, or being single) can be (subjectively) quantified by him. His extent of

[10] Zelder (1993a) is a less technical (more accessible) presentation of the ideas in Zelder (1993b).

preference can be referred to as his *gains from marriage* to Lucia. Suppose, for concreteness, that these gains are worth a particular amount to him, say, 100,000 euros. This implies that he would be willing to give up 99,999 euros to induce Lucia to remain married to him. For her part, suppose that Lucia prefers divorce to remaining with Mercurio, and that her *gains from divorce* amount to 50,000 euros. In principle, then Mercurio could succeed in inducing Lucia to remain married by altering his behavior (being more pleasant to her, spending less money on himself and having her spend more on herself, performing household chores in her stead, etc.) such that she gains more than 50,000 euros. For instance, if he renegotiated their marriage such that she gained 80,000 euros, she would be happier (80,000 vs. 50,000), and he would be happier (he would still gain 20,000 = 100,000 – 80,000).

Mercurio's ability to do this, however, depends upon his being able to *transfer* these gains to Lucia. However, some gains cannot be transferred, namely, those gains that Lucia already is consuming. Specifically, whatever is a public good within marriage (children, home decorating, conversation, cleaning, financial management) is, by its essential nature, nontransferable. In other words, Mercurio cannot keep less of these public goods for himself and give more to Lucia. This is because a public good is intrinsically equally consumed; consider as an example their beautifully landscaped yard and garden, which they can view from their window. By its nature, Mercurio cannot have less of this for himself and give more to Lucia. This creates a problem if a large fraction of Mercurio's gains to marriage are in the form of public goods. Concretely, suppose that 65,000 euros of Mercurio's gains are in this public-good form. This implies that he can only use 35,000 euros (100,000 – 65,000) to endeavor to induce Lucia to remain married. But, in this situation, she declines his best offer, since the 35,000 she would gain from an improved marriage to Mercurio is less than the 50,000 she would gain from leaving Mercurio.

This is a problem not just for Mercurio, but for society as a whole. In this situation, Lucia divorces Mercurio even though the amount she benefits from doing so (50,000) is less than the harm to Mercurio (100,000). Under a utilitarian standard popular among economists (called Kaldor-Hicks efficiency), this sort of change is viewed as counter to society's interests (i.e., inefficient), in that the gain to the beneficiary (50,000, to Lucia) is less than the loss to the harmed party (100,000 to Mercurio). The implication of this is that these sorts of inefficient divorces are more likely as more of the gains to marriage are received in the form of public goods.

Love, as a prime example of a public good, then becomes problematic *and paradoxical*: the more that Mercurio and Lucia depend on love, the less able Mercurio is to dissuade Lucia from a divorce that will crush him emotionally although it will only mildly please her.

6. *Conclusion - Love labors found?*

Few would argue that love is profound, although sometimes tragic. Perhaps the same assessment can be made of this endeavor to understand love with economics. This paper has argued that love is indeed produced, although perhaps not in the more organized or concerted fashion that other household commodities are produced. As a consequence, love, by virtue of the special circumstances under which it is produced and consumed, is fraught with special problems, problems which, on the one hand, make it hard to produce as much love as is desirable, and on the other hand may imply that love is overproduced. But there is undoubtedly still much for economists to learn (and teach?) about love. It is hoped that this paper constitutes just the first encounter in a beautiful relationship.

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Abstract

While many scholars might think economics to be antithetical (or at least unrelated) to understanding love, I argue that it is central to this enterprise. This idea is developed by a conceptual exploration of how economic reasoning enhances our understanding of love. Specifically, I consider the economist's approach to love as a household commodity, as well as different sorts of love (requited, unrequited), and the (somewhat paradoxical) connection between accumulating love and relationship stability.