Domestic Violence: The Value of Services as Signals

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One of the questions asked most about domestic violence is why so many women return to their situations. The fact that many battered women reconcile with their abusers after calling the police or staying in a shelter is frustrating to those who provide services to battered women. This frustration could result in a declining quality of help for battered women. For example, Ronald Dolon et al. (1986) questioned police officers and found that the tendency of victims to drop charges is a leading factor in officers deciding not to arrest abusers. Shelter workers often measure success by the number of women that do not return to their abusers; consequently, there is considerable frustration with the large numbers of women who do return.

Why do many battered women go to a shelter or call the police only to return to the abuser in a few weeks or days or hours? While stereotypes that battered women are hysterical or masochistic are sometimes used to explain such behavior, social scientists have sought alternative explanations. Psychologist Lenore Walker (1979) pioneered in this area by applying the theory of learned helplessness to battered women. In answer to why battered women often return to the abuser, the learned-helplessness hypothesis proposes that battered women become psychologically paralyzed and, therefore, submissive. The learned-helplessness theory contributed to the psychologizing of domestic violence in the 1980's.

The psychologizing of domestic violence has brought criticism from many social scientists of turning a social problem into a psychological one. The answer to the question of why battered women return, they argue, should focus on gender inequality and deficiencies of the legal system and help sources, rather than on the deficiencies of the victim. Lee Bowker (1983) and Edward Gondolf and Ellen Fisher (1988) present evidence that battered women do seek help, but their calls for help come up empty. Women stay because staying is their best alternative. This survivor theory implies that women want help, and the more help available the less likely they are to stay or return. This notion has been incorporated into economic models of domestic violence (see Helen Tauchen et al., 1991; Farmer and Tiefenthaler, 1993), which show that the threat point increases when women have alternatives and when services are more helpful.

While the survivor theory provides a rational explanation for why women use services only to return to their abusers, it does not explain why battered women use the same service multiple times. Evidence shows that some battered women use services many times only to return to the abuser. While battered women undoubtedly use services for the security and help they provide, we suggest that battered women are rational actors who also use services to signal their threat points. The "bargaining model" we present provides a rational explanation for why some women use services even when they have no intention of leaving and proposes that women who use services as signals may be better off even if they return to the relationship. This result calls into the question the notion that the measure of success is a woman who leaves her abuser, because these services may be successful in improving her life even when she returns home.

I. The Bargaining Model

Because the households analyzed are characterized by domestic violence, the model of marriage presented is noncooperative and strategic. However, individual maximization does not preclude altruism. If the partner's utility enters each of the individual utility functions, the magnitude of the results change, but as long as the individual's own utility enters more strongly, the general predictions of the

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model are unaltered. Assume that the man's utility, U^M, is increasing in self-esteem, behavior modification, or other variables that are enhanced by his commission of violence.[1] We assume that, in abusive relationships, violence raises the man's utility through its impact on these factors. Denote these effects as $S(V)$, which is strictly increasing in violence, V. If C^M is his consumption and Φ denotes marital capital that offers the man utility within the relationship but does not remain if he is single, then his utility can be expressed by $U^M(C^M, S(V), \Phi^M)$. Assuming he receives positive utility from violence and marital-specific capital, this is greater than his external utility, $\bar{U}^M$.

Assume that her utility, $U^W(C^W, V, \Phi^W)$, is strictly decreasing in V. $\bar{U}^W$ is the woman's threat point or external utility level; her utility must be at least $\bar{U}^W(C_S^W)$ where the subscript S denotes her level of consumption when she is single. This level of consumption depends on her income, I^W, and the level of available support services. These services, denoted $\mathcal{X}$ may include welfare payments, family support, or shelters, where $\mathcal{X}$ is represented in dollar terms. Her external income may also depend upon the man's income if there is an expected divorce settlement. If she expects to receive a fraction α of his income then $C_S^W = \alpha I^M + I^W + \mathcal{X}$ if the price of consumption goods is normalized to 1.

In Farmer and Tiefenthaler (1993), we develop a game-theoretic model with complete information in which the level of violence is a Nash equilibrium. We show that as the woman's threat point rises, which may occur due to availability of $\mathcal{X}$, the level of violence falls. Our present study considers the possibility of incomplete information in which the woman's threat point is unknown and services may offer additional strategic signaling benefits.

Assume that the woman can be of two types: either she is at her threshold and willing to leave (call her type L), or she is not willing to leave (call her type N). The woman knows her type, but her husband knows only the probability, p, that she is type L. Consider initially violence in households without available services. Without services, the woman has no ability to affect the violence through a signal; she only responds by leaving or staying.[2] He, however, chooses the level of violence knowing only the probability that he violates her threshold. V_L is the maximum level of violence that a type-L woman tolerates without leaving, while V_N is that which a type-N woman will endure. Note that $V_N > V_L$. Given these threshold levels, the man can choose V_L, the level of violence that does not violate the threshold of either type, or he can choose the higher level, V_N, which induces a type-L woman to leave but just makes a type-N woman willing to stay. All other levels of V are dominated by these two options.

In choosing between V_N and V_L, the man weighs the probability that she will leave against his additional utility from inflicting the higher level of violence, V_N. He chooses the soft strategy, V_L, if and only if

$$(1) \quad U^M(V_L) > p\bar{U}^M + (1-p)U^M(V_N).$$

The left-hand side represents his utility from choosing V_L and the right-hand side represents the expected utility from choosing V_N in which there is a probability p that she leaves and he achieves only his utility outside of marriage. Note that it is assumed that $U^M(V_N) > U^M(V_L) > \bar{U}^M$. If (1) holds, the man chooses V_L, and the woman endures this lower level of violence regardless of her type. Otherwise, he chooses V_N and she leaves with probability p, the probability she is of type L; in this case a woman of type N stays and endures V_N.

[1] The goal of this research is not to answer the question of why some men want to batter their partners. That some men batter and receive positive utility from doing so is an assumption of this model. In addition, note that we characterize households where domestic violence takes place as a distinct group, rather than assume that there is a continuum such that violence can take place in any household if certain variables change.

[2] Previous models incorporate the woman's ability to affect V through her behavior and working decisions. We assume that she is optimizing within the marriage, but do not explicitly model those choices, since our focus is specifically the use of outside services. Those internal optimizations determine whether she is able to reach her threshold or not. See Tauchen et al. (1991) and Farmer and Tiefenthaler (1993) for models of within-marriage optimizations.

Assume now that services for battered women are available and that they provide no value to her other than their ability to serve as a signal. A woman of type N may try to use the services to signal that she is type L. If the bluff works, the man may decrease the level of violence to keep her inside the relationship, thus raising her utility level. However, using services, involves costs which may include time costs, embarrassment, and additional violence from the man if she is caught bluffing. However, the overall impact of successfully bluffing must be positive for the game to be interesting. Therefore, we assume that $U^W(V_N) < U^W(V_L, \text{costs})$.

The game cannot support a pure-strategy separating equilibrium. A pure-strategy pooling equilibrium in which all women use services is only supported if the man has the incentive to respond with a soft strategy in every situation. Assume that a type-N woman bluffs 100 percent of the time. Then after she uses services, the man's updated probability that she is type L is still p; no updating occurs since women of both types always use services. If he has the incentive to respond softly, then no woman would change her 100-percent bluffing strategy, and the equilibrium is supported. Expression (2) is the condition under which the man's response is soft and the pooling equilibrium exists:

$$(2) \quad U^M(V_L) > p\bar{U}^M + (1-p)U^M(V_N).$$

If (2) holds, his response is soft, which reinforces the strategy of all women to bluff. However, if (2) fails and he instead has the incentive to be tough, bluffing is no longer optimal, and the pure-strategy pooling equilibrium is not supported.

If condition (2) fails, no pure strategy exists. However, a mixed-strategy equilibrium exists in which type-N women bluff some *percentage* of the time and men choose a tough response to the use of services some *percentage* of the time. Thus, to support a mixed-strategy equilibrium, a type-N woman must be indifferent between bluffing and not bluffing. In any equilibrium, a type-L woman always uses services since it is not a bluff. If a type-N woman admits that she is type N by choosing no action, she gets $U^W(V_N)$. Suppose she knows that if she chooses to use a service the man chooses a tough response with probability Ω. Then, bluffing yields her an expected utility of $\Omega U^W(V_N, \text{costs}) + (1-\Omega)U^W(V_L, \text{costs})$.

The mixed-strategy equilibrium that isolates the value of Ω under which the woman is indifferent is

$$(3) \quad \Omega = \frac{U^W(V_L, \text{costs}) - U^W(V_N)}{U^W(V_L) - U^W(V_N, \text{costs})}.$$

If the man chooses a tough strategy with any probability greater than Ω, the woman prefers to admit the truth and not risk bluffing. If Ω is lower, she prefers to bluff. What ensures that the man chooses a tough strategy with the probability Ω in (3)? If he plays a mixed strategy with *any* set of probabilities, he is indifferent between his choice of a hard or soft strategy. What is required to ensure his indifference? His utility from choosing the soft strategy is $U^M(V_L)$, while his expected utility from choosing the tough strategy depends on the updated probability that she is type L. Assume that q represents the Bayesian updated probability that she is type L given that she uses services. If β is the probability that a type-N woman bluffs, then by Bayes' rule, $q = p/[p + (1-p)\beta]$, and a tough response yields him $q\bar{U}^M + (1-q)U^M(V_N)$. The mixed-strategy equilibrium isolates β:

$$(4) \quad \beta = \frac{pU^M(V_L) - p\bar{U}^M}{(1-p)U^M(V_N) - (1-p)U^M(V_L)}.$$

What induces a player who is indifferent over a set of probabilities to choose the precise probability that ensures the stable equilibrium? Since the man is indifferent between being tough, soft, or any combination thereof, suppose he instead decides to be tough with some probability other than Ω. If Ω rises above that in (3), the woman faces a greater likelihood of being sorted (i.e., of having her bluff called) and therefore is no longer indifferent between bluffing and not bluffing; instead she never bluffs. If we think in a continuous process, she is less likely to bluff. As she bluffs less, he sorts, which pushes Ω down. Similar pressures on both probabilities generate a stable equilibrium.

How does this equilibrium compare with that in the model with no services? Note that a type-L woman always has the same utility level since she is indifferent between leaving and remaining in the relationship. It is the woman without a credible threat to leave whose utilities may differ. Without services, if condition (1) holds, the man never sorts and all women benefit; the violence is V_L for all women, and no women leave. If (1) fails, his strategy is tough. Thus, type-L women leave while type-N women endure the higher level of violence V_N. The model that includes services has two possible equilibria. If (2) holds, there is a pooling equilibrium in which everyone bluffs, men respond softly, and all women stay at a lower level of violence V_L. If (2) fails, there is a mixed-strategy equilibrium in which some percentage of type-N women bluff and succeed while others fail and fare worse for having tried.

In comparing the models, notice that (2) is identical to (1). If this condition holds, the end result is the same under each model: the man responds softly, the woman stays, and the level of violence is V_L. How do the two models compare when this condition fails? In the first model, the man always inflicts a higher level of violence, V_N, which all type-N women stay and endure. In the second model, he chooses V_N in two situations: (i) if she admits her type is N by not using services and (ii) if she bluffs, some percentage of the time (Ω) he chooses V_N. Thus, there is a chance $(1 - \Omega)$ that her bluff succeeds. This implies that services result in a lower level of violence for type-N women who successfully bluff, which occurs with probability $(1 - \Omega)\beta$, the probability that she chooses to bluff (β) and it works $(1 - \Omega)$.

Although the availability of services offers some chance for an improvement for type-N women, these benefits come with costs. A type-N woman who bluffs and gets called, ends up worse since she paid the costs of service use. The probability that this occurs is $\beta\Omega$; since this type of woman will never leave, she would have been better off had she not utilized the services. Recall, however, the assumption that services have no inherent value other than as a signal.

Adding nonvaluable services to the model leads to the same outcome for all battered women except type-N women that bluff. Type-N women who successfully bluff are better off than they would be without services, while type-N women who bluff and get caught are worse off. Consequently, the effects of services on the overall welfare of battered women depend upon how many women bluff, β, and how many succeed, $1 - \Omega$. While the man's probability of sorting, Ω, determines the ratio of winners, $(1 - \Omega)\beta$, to losers, $\Omega\beta$, her probability of sorting, β, is also important in the evaluation of the overall value of services as signals. If β is small, few women use signals. However, if bluffing becomes a significant strategy choice, then studying its impact and implementing policies that lower Ω is more important.

Comparative statics on β from equation (4) indicate the following: $\partial\beta/\partial p > 0$ and $\partial\beta/\partial V > 0$. The latter result is intuitive; the more violent the household, the more likely a woman uses the signal to bluff. Combined with the result that women in more violent households are likely to have higher success from bluffing (discussed below), this result indicates that the benefits from services as signaling devices are greatest in the most violent households. The former result, $\partial\beta/\partial p > 0$, implies that as the unconditional probability that she is likely to leave rises, so does the probability of bluffing. Consequently, raising the number of women who have credible threats encourages those who do not to try to bluff. If bluffing is a positive event, then policies that increase p have benefits in addition to those pertaining to the specific woman whose outside options are improved. Whether increased bluffing is considered a positive event depends upon two factors: (i) if Ω is small, then bluffing is successful for a greater percentage of women; and (ii) even if Ω is large and a significant number of women pay the price for bluffing, if bluffing costs can be minimized, the losses can be kept small relative to the gains.

The parameter Ω, the probability that the man sorts, determines what percentage of women who bluff benefit from the availability of services.[3] Comparative statics on Ω from

[3] In addition to the probability of receiving benefits versus losses, the magnitude of these benefits and costs

(3) indicate that $\partial\Omega/\partial(\text{costs}) < 0$ and as long as type-N bluffers and nonbluffers receive the same disutility from additional violence then $\partial\Omega/\partial V < 0$. The first result implies that, as service costs increase, the man responds to the use of services more favorably. As service costs increase, they provide a stronger signal of her type and thus are more likely to generate a positive response. This indicates that policies that raise the costs of bluffing make her signal more meaningful and increase the percentage of bluffers who are successful; however, it also means that an unsuccessful bluff is more costly. The second comparative static indicates that an increase in violence decreases the likelihood that he responds toughly. Since he is more likely to believe the signal, women in more violent households are more likely to benefit from the signaling potential of services.

Finally, these results for β and Ω result from the mixed-strategy equilibrium, which holds only when (2) fails. In addition to affecting β, the probability that a woman is type L, p, also affects the likelihood that this condition holds in the first place. Recall that if (2) holds, there is a pure-strategy equilibrium in which all women bluff and men always respond positively. As p rises, this equilibrium in which a woman of type N always is treated as if she is type L is more likely to hold. Thus, raising the overall power of women can positively impact women whose power does not increase.

As services become more valuable, more women utilize services, making the man more likely to benefit from calling the bluff; therefore their signaling value drops. Because valuable services increase the threat points of all battered women, the level of violence for each type of woman falls. However, more women are unsuccessful bluffers. (See Farmer and Tiefenthaler [1995] for further analysis.)

II. Discussion, Empirical Evidence, and Policy Implications

The model suggests that some women use services to facilitate leaving the relationship, while other women use services even though they are not in a position to leave. These latter women use the services to bluff to misrepresent their threat points in order to decrease the violence. The model predicts that as long as β (the proportion of type-N women who bluff) is greater than 0, even services whose sole value is signaling affect battered women. The larger β is, the greater the effects of services. That battered women use services as bluffs is supported by the large number of women who use services only to reconcile with the abuser and the large number of women who repeatedly use the same services. Bowker's (1983) study of 150 formerly abused women supports the hypothesis that battered women use services as signals. Bowker found that making a threat to leave was the most successful technique used by the women to decrease the violence.

Are services helpful to battered women? If $\beta > 0$, whether service use helps more women or hurts more women in terms of decreasing or increasing the violence depends on Ω. As long as $0 < \Omega < 1$, there are some battered women who benefit and some who lose from the use of a service. However, if $\Omega < 0.5$, more women are helped than are hurt as the violence decreases for $1 - \Omega$ of the bluffers. The remaining Ω of the bluffers are worse off as they pay the costs of using the service, which often include more violence.

Previous work supports the hypothesis that some battered women who return to their abusers after using a service are better off, while others are worse off. Richard Berk et al. (1986) focus on the effectiveness of a shelter stay in decreasing the violence for women who return to their abusers and propose that the success of shelter use depends on how credible the threat seems to the abuser. Their empirical work supports this hypothesis. The results indicate that women who go to shelters and return home experience significantly more violence if they exhibit no other help-seeking activity. However, for each additional help-seeking activity (a previous shelter stay, trying to get a restraining order, etc.) undertaken, the threat of leaving is more credible and, therefore, the violence falls. Consequently, while noncredible threats result in more violence, women who bluff but have a more credible

should be mentioned. Obviously, as the costs of an unsuccessful bluff fall, those who do lose something from this strategy lose less.

threat are successful in controlling the violence to some degree.

The result that shelter use leads to more violence for some women who return home is troubling from a policy perspective. Consequently, the size of Ω (the number of women who are unsuccessful bluffers) is important. If Ω is small, service use helps more women than it hurts. The Berk et al. (1986) study finds that 81 percent of the women experienced no new violence after their return from a shelter. In addition, data from the Charlotte Spouse Assault Replication Project, 1987–1989, indicate that 76 percent of the women said that help-seeking led to less violence at least for a while, and Patrick Langan and Christopher Innes (1986), using data from the National Crime Survey, 1978–1982, report that 84 percent of battered women who called the police experienced no additional violence. While these samples indicate that Ω is small, further data collection and analysis on the effects of service use for women who return home are needed.

While our model and empirical evidence indicate that service use may be harmful for some bluffers, these potential negative effects of service *use* may be outweighed by the positive effects of service *availability*. Simply making valuable services available to battered women is an effective way of reaching battered women because the existence of valuable services increases their threat points and, therefore, improves their lives even if they never use the services. Increasing threat points leads to both more women leaving and less violence for women who stay. Tauchen et al. (1991) and Farmer and Tiefenthaler (1993) find that increasing the woman's income level has a negative effect on violence. This model also predicts that some women who use services and return home are better off from *using* services if the bluff is successful. It is also important to note that the model predicts that the most valuable services entice the most bluffers (see Farmer and Tiefenthaler [1995] for further discussion). Consequently, services that have the most positive effects on the lives of battered women are also likely to have the lowest "success" rates.

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