10-2016

The Timing of Welfare Payments and Intimate Partner Violence

Lin-chi Hsu
Grand Valley State University, hsulinch@gvsu.edu

Economic Inquiry

THE TIMING OF WELFARE PAYMENTS AND INTIMATE PARTNER VIOLENCE

LIN-CHI HSU*

I examine transfer schedules for the Temporary Assistance for Needy Families (TANF) program and find a causal relationship between the time directly after welfare payments and intimate partner violence against women. This study supports the hypothesis that the husband uses threats of violence as an instrument to gain control over the allocation of household resources, and suggests that the increased incidence in physical violence after welfare payments is associated with alcohol use. Additionally, I find that states that pay TANF recipients twice a month do not have this effect on threats of violence. This suggests that smaller, more frequent payments may reduce the husband's incentive to use verbal violence as a bargaining tool. (*JEL* I38, J18, J12)

I. INTRODUCTION

Violence against women not only inflicts physical and psychological harm on the victim, but also harms the next generation. For instance, a newborn whose mother experiences domestic violence weighs significantly less than average, and prenatal assault has led to a 1.2% increase in fetal death (Aizer 2011). Domestic violence is also costly. In terms of medical services and forgone productivity, the annual cost of domestic violence in the United States is estimated to be $5.8 billion (National Center for Injury Prevention and Control 2003).

Many household bargaining models portray a husband who uses violence or threats to extract resources. A noncooperative bargaining and signaling model developed by Bloch and Rao (2002) suggests that in dowry-based societies such as India, the husband uses violence to signal his dissatisfaction in order to gain further dowry payments from the bride's family. A more recent study (Bobonis, González-Brenes, and Castro 2013) modifies Bloch and Rao's model and predicts that an increase in the female partner's income will lead to more threats—but not more physical violence—from her spouse. In this article, I study the impact of the timing of welfare payments on intimate partner violence (IPV) in the United States.

Welfare transfers increase the recipient's spending immediately (Stephens 2003). Because of the difference between genders in consumption behavior (Lundberg, Pollak, and Wales 1997; Rubalcava, Teruel, and Thomas 2009), I test the hypothesis that men use violence to control the resources granted by a welfare transfer. To explore this idea, I evaluate the timing of welfare payments' influence on domestic violence by exploiting exogenous state-level variation in welfare payment schedules.

This study addresses some empirical challenges in the literature. First, most studies of the relationship between welfare transfers and domestic violence have used cross-sectional data, which do not account for the timing of welfare

*The author thanks the journal editor, Wesley Wilson, three anonymous reviewers, Alexander Henke, Seik Kim, Mark Long, Elaina Rose, Hendrik Wolff, Richard Zerbe Jr., participating state TANF administrators, seminar participants at University of Washington, Seattle, and participants at the 2014 Cooperation and Conflict in the Family Conference, the 2014 Western Regional International Health Conference, and the 2014 Canadian Economics Association Annual Conference for helpful comments.

Hsu: Visiting Faculty, Department of Economics, Grand Valley State University, Allendale, MI 49401. Phone (616)-331-7231, Fax (616)-331-7421, E-mail hsulinch@gvsu.edu

ABBREVIATIONS

EBT: Electronic Benefit Transfer
IPV: Intimate Partner Violence
IRR: Incidence Rate Ratio
NIBRS: National Incident-Based Reporting System
SNAP: Supplemental Nutrition Assistance Program
SSI: Supplemental Security Income
TANF: Temporary Assistance for Needy Families
UCR: Uniform Crime Report

Economic Inquiry
(ISSN 0095-2583)
Vol. 55, No. 2, April 2017, 1017–1031
doi:10.1111/ecin.12413
Online Early publication October 21, 2016

payments and the timing of violence. The majority of welfare recipients have less income and are less educated, on average, and may have other unobservable characteristics that are correlated with domestic violence reports. Without accounting for these unobserved characteristics, we cannot construct a causal relationship between welfare and domestic violence. Second, much of the literature uses survey data, which may suffer from small sample size, false reports, and a lack of detailed incident information. Lastly, the timing of other income, such as paychecks, may overlap with welfare transfers, and the receipt of other income could affect domestic violence reports in a similar fashion; this could affect all working families, not only those that receive welfare transfers. When the wife receives her paycheck, the husband has a similar incentive to use violence to gain control of the money based on instrumental violence theory; if the wife receives a paycheck and the welfare transfer at the same time, the husband has even more motivation to use violence. However, most studies of the timing of welfare payments do not control for the most common timing of paychecks. Without considering this paycheck effect, the estimated effect of welfare transfers on domestic violence may capture both the effect of welfare transfers and this secondary effect.

To overcome these challenges, I apply three methods. First, I use a survey of state-level welfare payment schedules to develop an index that represents the number of days since Temporary Assistance for Needy Families (TANF) recipients' most recent payment. This measure represents the exogenous variation in TANF recipient transfers between states. Second, I build a daily count of IPV for each agency—that is, police jurisdiction—by using panel data from aggregated official police reports. This also allows me to distinguish physical violence from verbal violence and, as a result, better categorize the extent of IPV. Lastly, I control for the most common paycheck timings to separate a worker's paycheck effect from any TANF-based effect.

The study demonstrates an increase in reports of male-on-female assault and intimidation shortly after receiving welfare payments. As noted previously, my findings are consistent with instrumental violence theory, in which the husband uses violence as an instrument to control the wife's behavior or control household resources (Bloch and Rao 2002; Bobonis, González-Brenes, and Castro 2013; Eswaran and Malhotra 2011; Felson and Messner 2000). This effect dominates the predicted effects in Farmer and Tiefenthaler's (1996) noncooperative model, in which the woman's threat point increases as her income increases. At the same time, her tolerance for violence decreases, and she is more likely to leave the abusive relationship.

When the analysis is restricted to sober offenders, I find an effect for intimidation but not for assault. This suggests that threats of violence are used as an instrument to control household resources; however, physical violence may be a consequence of increased alcohol consumption around the time of welfare receipt. Additionally, I find evidence to suggest that states that pay welfare recipients more frequently do not experience an increase in male-on-female intimidation shortly after receiving welfare payments. I conjecture that frequent, small welfare payments may reduce the offender's incentive to issue threats.

II. DOMESTIC VIOLENCE AND INCOME

Economic theories of domestic violence are built on game theoretic models of marriage. The earliest household bargaining models treat marriage as a cooperative game, and household demand results from household resources and the resources held by each spouse. If one's utility in the marriage is less than the maximum level of outside-marriage utility (threat point), then one chooses to divorce. The household resource allocation fits the husband's preference more if the husband has a higher threat point (Manser and Brown 1980; McElroy and Horney 1981). Lundberg and Pollak (1993) provide a separate-spheres bargaining model with a noncooperative equilibrium taking the place of divorce.

In addition to the threat point that determines the family resource distribution, theorists also predict that violence will change the household resource allocation. IPV can be explained as an instrument for controlling the spouse's behavior or as a way to release frustration, that is, expressive violence. Expressive violence theory suggests that the offender effectively pays the victim for violence, while instrumental violence theory argues that the offender uses violence or threat as a tool to extract money from the victim or to control the victim's behavior (Bloch and Rao 2002; Bobonis, González-Brenes, and Castro 2013; Eswaran and Malhotra 2011; Felson and Messner 2000). Within this framework, violence decreases the offender's utility *ceteris paribus*, but increases his power. Bloch and Rao

(2002) build a noncooperative bargaining and signaling model of dowries and family violence in which the husband has private information about his marital satisfaction. In India, for instance, a dissatisfied husband may use violence as a tool to signal his dissatisfaction—and hence collect a larger dowry—from the bride's parents. Using survey data collected from Southern India, Bloch and Rao find that wives from richer families are more likely to be beaten by their husbands.

Moreover, Tauchen, Witte, and Long (1991) build a noncooperative family decision-making model that incorporates violence. This model implies that the effect of income on IPV depends on whether the woman's reservation utility is binding. Using a series of 125 interviews with women who had experienced physical IPV, they find that for low-/middle-income households, an increase in the wife's income is negatively correlated with IPV, which suggests that the man must pay more for violence when the woman's outside option is binding. For high-income households, the effect of income on IPV depends on who in the household earns most of the income. If the husband earns most of the household income, an increase in the wife's income decreases IPV. If the wife brings in most of the household income, an increase in the wife's income increases IPV.

However, using a woman's income as a proxy for bargaining power is problematic. A woman's observed income at the bargaining equilibrium may differ from her income at the threat point; for instance, a divorced woman is more likely to work than a married woman (Pollak 2005). Another common problem is reverse causality. For example, a woman's income often relies on her physical health, but her physical health depends on whether her husband uses violence. Wage rates or potential wages, therefore, are considered to be better estimates of bargaining power. Using California inpatient hospital data, Aizer (2010) finds that a decrease in the gender wage gap decreases domestic violence. This study tackles the issue of the endogeneity of income by focusing on exogenous welfare-transfer schedules.

Other than her financial status, a woman's education and age at first marriage also influence domestic violence. Based on survey data collected in Dhaka, Bangladesh, Heath (2014) finds that among women with less education, women who marry young and working women are correlated with higher domestic violence.

In contrast to instrumental violence theory, the theory of expressive violence argues that the offender uses violence to relieve frustration and otherwise gain utility. Stress from work, high temperatures, an increase in the victim's income, or even unexpected outcomes of sporting events can induce domestic violence. Card and Dahl (2011) show that in the United States, unexpected local professional football losses are associated with a 10% increase in IPV against women. Also, if the wife's economic status threatens the husband's family status, the "backlash" theory predicts higher family violence: When the wife becomes more economically independent, the insecure husband resorts to violence. The effect of the wife's economic status on family violence depends on the husband's economic status. One indicator of women's economic status is labor force participation. The wife's labor force participation reduces the likelihood of family violence when the husband is employed—but increases the risk of family violence when the husband is unemployed (Macmillan and Gartner 1999).

III. DOMESTIC VIOLENCE AND WELFARE

A. Empirical Studies of Welfare Transfers and Domestic Violence

The effect of welfare transfers on domestic violence is complex. It can depend on the husband's education, the wife's education, the relative spousal education, the spousal age gap, the transfer size, and the timing of the transfer. The wife's education is negatively correlated with the likelihood of being assaulted by the husband. Hidrobo and Fernald (2013) find that randomized roll-out cash transfers in Ecuador decrease psychological violence received by a wife if her education is greater than primary school. A woman with higher education has higher potential wages, and therefore an increase in income reduces domestic violence because she is more likely to leave an abusive relationship. The effect of a cash transfer is ambiguous, however, if the wife's education is less than or equal to primary school.

Large transfers are often associated with an increase in domestic violence. Angelucci (2008) studies the effect of the Mexican Oportunidades welfare program on domestic violence, and finds that a relatively large welfare transfer increases physical violence against women. Meanwhile, a relatively small welfare transfer reduces physical violence—but increases threats—by husbands. However, the decrease in physical violence caused by transfers may be temporary. By studying the same welfare program, Bobonis,

González-Brenes, and Castro (2013) demonstrate that women who receive welfare transfers experience less physical violence in the short run, but there is no significant difference in the long run.

B. Welfare Payment Timing and Domestic Violence

The timing of transfers is an important factor in studying the pattern of violence. For instance, Stephens (2003) finds that households increase spending immediately after receiving a Social Security check. Foley (2011) studies the relationship between crime and timing of welfare payments from TANF, the Supplemental Nutrition Assistance Program (SNAP/food stamps), and Supplemental Security Income (SSI) in 12 U.S. cities. He hypothesizes that welfare recipients in states with monthly welfare transfers have enough resources at the beginning of the month, but they may exhaust the welfare transfer and supplement it with criminal income at the end of the month. To support this, he finds that financially motivated crime is lower during the first 10 days of the month in early payment states.

IPV can also be viewed as a financially motivated crime since abusers use violence as an instrument to take resources from their victims. Alternatively, abusers may be paying their victims to endure violence without exiting the relationship. Either way, money plays a significant role in domestic violence. A natural experiment in a British welfare program (Lundberg, Pollak, and Wales 1997) shows that women's consumption behavior is different from men's consumption behavior. In rural Mexico, for instance, welfare transfers controlled by women are more commonly spent on investments in their children as opposed to short-term consumption (Rubalcava, Teruel, and Thomas 2009). Because of the differences in consumption behavior between male and female household members, there is a strong incentive to use violence to control resources immediately following receipt of a welfare transfer. Using Canadian crime reports in 14 Canadian census metropolitan areas, Cormier (2009) finds that reports of IPV increase soon after social assistance transfers are received.

C. Theoretical Approaches

Household bargaining models emphasize the importance of outside options in resource allocation decisions. If a woman's outside option improves, the woman receives better treatment to avoid a breakdown in bargaining, which is generally interpreted as divorce (Aizer 2010; Tauchen, Witte, and Long 1991). However, some women with little bargaining power cannot afford a divorce. Bobonis, González-Brenes, and Castro (2013) construct a household bargaining model with private information in which the husband uses threats of violence to signal his marital dissatisfaction. In their model, intimidation is a form of verbal violence that reduces both partners' utilities, but the man can use such threats credibly to induce favorable bargaining results. When the woman receives the welfare transfer, Bobonis et al.'s model predicts that there will be an increase in intimidation without associated physical violence, since the husband can extract more potential rents with verbal violence.

To examine the impact of welfare transfers on IPV for women with low bargaining power, I use exogenous policy variables to test the relationship between income flows and IPV. This study is the first to carefully estimate the impact of welfare payments on IPV by using data from a large and representative sample of households. In doing so, I provide unique evidence to support a key prediction of instrumental violence: that the man will use threats to secure a monetary transfer when the woman receives income. This study also provides evidence for a potential benefit of increasing the frequency of welfare transfers.

IV. DATA AND METHODS

A. Overview of the TANF Program

TANF was previously known as Aid to Families with Dependent Children before welfare reform in 1996. Needy families with at least one dependent child are eligible for TANF, but eligibility varies across states; in general, if the family's income or assets are below the state's minimum subsistence level, it may qualify for the TANF program. For example, in Washington State, the maximum income for initial eligibility for a family of three was $1,122 per month, and the asset limit was $1,000 as of July 2008.[1] In the United States, the monthly average earned income was $839 for TANF families with income in Fiscal Year 2008.[2]

1. Resources counted include checking and saving accounts, stocks, bonds, mutual funds, and vehicle equity of more than $5,000.

2. From the Characteristics and Financial Circumstances of TANF Recipients database maintained by U.S. Department of Health & Human Services.

TANF provides needy families with medical services and temporary cash assistance; the amount of the cash benefit depends on the family's size, income, assets, and expenses.[3] The average monthly welfare payment per recipient household in the United States was $383 in Fiscal Year 2008. The recipient is required to begin working within 2 years, and cannot receive the benefit for more than 60 months during his or her lifetime.

In Fiscal Year 2008, the total number of families receiving TANF cash benefits was almost 2 million. Among adult recipients, 87.3% were female, 35.2% were white, 35.0% were African American, and 23.3% were Hispanic. In Fiscal Year 2008, among adult recipients, 70.4% were single, 13.3% were married, 9.9% were separated, 0.5% were widowed, 5.9% were divorced, 25.9% were employed, and 46.8% were unemployed. In Fiscal Year 2008, among families receiving TANF benefits, 3.8% were two-parent families, 48.7% were one-parent families, and 47.5 % were child-only families.[4]

The timing of TANF payments is set at the state level, and recipients cannot choose the transfer's timing. If payments are staggered for different recipients, the timing of a specific recipient's transfer may depend on the last digit of the recipient's Social Security number or the first letter of the recipient's last name. Because TANF recipients cannot affect the timing of welfare payments, I treat state-level variations in TANF payment schedules as exogenous with respect to aggregated reports of domestic violence.

There are two reasons to study the timing of TANF payments. First, the TANF program targets low-income families with children, while other major social welfare programs target individuals instead of families. For example, SNAP gives people with low income and resources a monthly benefit to buy food, and SSI provides benefits to adults and children who have low income and resources. Second, women from low-income families are more likely to be victims of domestic violence; females with annual household incomes around $10,000 are victimized five times as often as those with annual household incomes around $30,000 (Zawitz 1994). Also, women who receive welfare benefits are more likely to experience IPV. Based on survey data from Michigan, 63% of female TANF recipients had experienced physical violence by their partners in their lifetime; 61% had received threats from their partners in their lifetime; and 51% had experienced severe physical violence by their partners in their lifetime (Tolman and Rosen 2001). In addition, the majority of female family violence victims live with children (Kimerling and Baumrind 2004).

I conducted a survey of TANF administrators, managers, or specialists in most states. In the survey, I asked the respondent's title, the state's TANF payment method(s),[5] the frequency of payments, whether the state staggered payments among recipients, and the transfer delivery day.[6] Table 1 shows the TANF transfer delivery day, frequency, whether the payment is staggered among recipients, number of recipients per capita, and the maximum monthly benefit for a family of three without income for each state in the sample. Of the 21 states, nine states deliver on the 1st calendar day of each month,[7] four states deliver on the 1st business day of each month, one state pays on the 30th day, three states stagger payments from the 1st to the 3rd day of each month, one state staggers payments from the 1st to the 5th day of each month, and three states pay all recipients on the same day, but twice a month. In some states (e.g., Wisconsin and New Hampshire), the delivery day may overlap with the timing of a monthly or twice-monthly paycheck, for example, the middle or end of the month. To better view variations in TANF delivery dates among states, see Figure 1 for TANF delivery schedules.

I use this payment schedule to calculate the average number of days since the last payment, hereafter called "index." If the state pays recipients on more than 1 day and staggers payments

3. A household's expenses depend on the cost of living in the state. Differences in average TANF transfers, therefore, may not reflect differences in the purchasing power of those transfers.

4. Statistics are calculated from caseload data maintained by the U.S. Department of Health & Human Services. Child-only families are cases in which the caretaker is a nonparent relative, or the parent does not receive the benefit. Similarly, one- and two-parent families count the number of recipients, not necessarily the number of adults in the household.

5. In most states, recipients receive TANF payments through electronic benefit transfer (EBT) cards or debit cards; technically, every household member would have access to the EBT card. According to national TANF data, in 2010 the number of female recipients aged over 20 was 5.5 times the number of male recipients aged over 20.

6. Some states pay on the first calendar day with an EBT card and the first business day with a check. In this case, I calculate the average number of days since the last payment using the first calendar day as the delivery day.

7. There are several plausible explanations why so many states issue payments on the first of the month, including administrative ease, major expenses such as rent coming due around that time, and alignment with paycheck income.

TABLE 1
TANF Cash Assistance Delivery Schedule, Participation Rate, and Maximum Monthly Benefit

State	Frequency per Month	Delivery Day	Staggered among Recipients	Recipient/ Capita (%)	Maximum Monthly Benefit for a Family of 3 with No Income ($)
Arkansas	1	1	No	0.68	204
Colorado	1	1–3	Yes	0.42	356
Connecticut	1	1–3	Yes	0.93	560
Iowa	1	1	No	1.28	426
Kansas	1	1	No	1.12	429
Louisiana	1	1–5	Yes	0.52	240
Maine	1	1	No	1.82	485
Montana	1	1	No	0.85	472
New Hampshire	2	15, 30	No	0.73	625
North Dakota	1	1[a]	No	0.88	477
Ohio	1	1[a]	No	1.59	410
Oregon	1	1	No	1.17	514
Rhode Island	2	1,16	No	1.76	554
South Carolina	1	1[a]	No	0.86	263
South Dakota	1	1[a]	No	0.77	539
Tennessee	1	1	No	2.28	185
Texas	1	1–3	Yes	0.47	244
Vermont	2	1, 15	No	0.99	640
Virginia	1	1	No	0.88	320
Washington	1	1	No	1.89	562
Wisconsin	1	30	No	0.67	628

Notes: "Staggered among recipients" means the TANF payment does not pay all recipients on the same day. TANF caseload data are from the U.S. Department of Health & Human Services for October 2008. Population data are from the Population Division, U.S. Census Bureau for 2008. Maximum monthly benefit is from the Urban Institute's Welfare Rules Database for 2008. Recipients per capita are 1.27% in the United States.
[a]States deliver TANF payments on the first business day of each month.

among recipients, I assume that an equal amount of people are paid on each transfer day. See Appendix A in Appendix S1, Supporting Information, for a detailed example.

The ideal way to choose a study sample would be to select cities with high recipient rates. However, city-/county-level TANF caseloads are not available in government publications. Fewer recipients in sample cities would create noise, but should not bias estimations.

B. The National Incidence-Based Reporting System

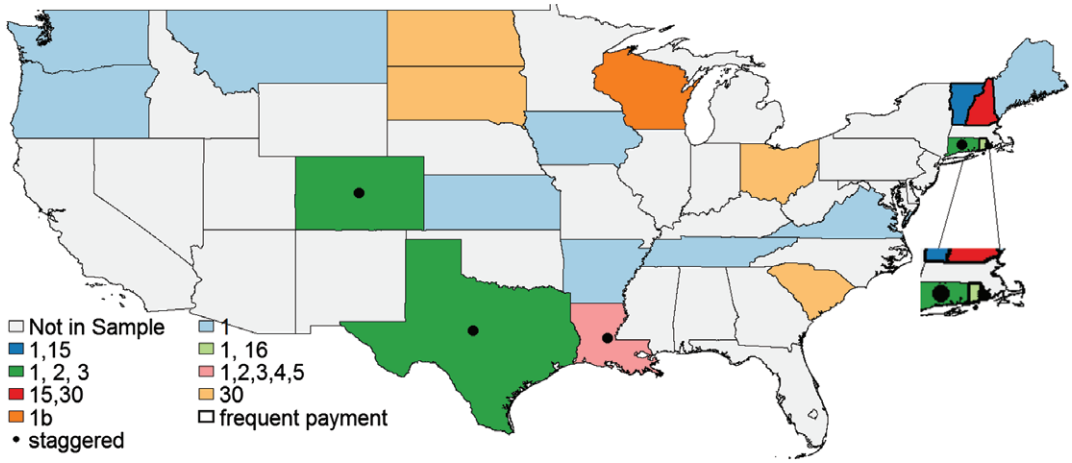
Data for my empirical analysis primarily come from police reports of domestic violence in the National Incident-Based Reporting System (NIBRS).[8] The NIBRS is part of the FBI's Uniform Crime Report (UCR) Program, which records all criminal incidents reported by participating police agencies. In 2006, NIBRS data included 25% of the U.S. population. Each incident report provides detailed information on the victim, the offender, and the incident. There are two advantages to using the NIBRS. First, I am able to differentiate the types of domestic violence by physical violence and verbal violence. Second, the NIBRS includes incident dates, which allows me to exploit the pattern of daily domestic violence. UCR data, in contrast, are only available at the monthly level, and still other survey data may only ask the respondent whether she had been assaulted by her husband in the previous 12 months. Such broad categories make it difficult to examine the effects of daily timing.

One limitation of the NIBRS is that it only includes domestic violence that was reported to police; victims may choose not to involve the police because they consider the incident to be a personal matter or want to protect the offender.[9] The change in reported crime—that is, the daily variation in IPV reports—may be due to a change in real crime incidence or a change in reporting behavior. If the change in reporting behavior

8. Crime data for Texas are from the Family Violence Report of the Texas Department of Public Safety.

9. About 60% of domestic violence cases were reported to police between 1998 and 2002, based on the National Crime Victimization Survey (Durose et al. 2005).

FIGURE 1
TANF Cash Assistance Delivery Schedule, Frequency, and Staggered Payments



Notes: "1b" means that the state pays recipients on the first business day of each month. Among the states in the sample, nine states deliver on the 1st calendar day of each month, four states deliver on the 1st business day of each month, one state pays on the 30th day, four states stagger payments among recipients, and three states (with thick outlines) have frequent payments.

is correlated to the timing of welfare payments, then my estimate of the increase in domestic violence near the transfer-delivery date will be biased upward. One way to mitigate this potential bias is to identify reports that are more likely to be strategic. The NIBRS provides information on whether the incident happened on the same day as the reporting date or prior to the reporting date.[10] If the incident happened prior to the reporting date, the date of the actual incident is unknown. The potential tendency for victims to report previous incidents of violence near the timing of the welfare transfer is one example of reporting bias. To avoid this issue, I limit data to incidents that occurred on the same day as the report.[11]

Another limitation of the NIBRS is that it does not state whether the victim was a welfare-program participant. The reported cases of IPV, therefore, include both victims who receive TANF and those who do not. I control for the most likely paycheck timings, to separate the instrumental violence effect on reported IPV, by distinguishing working families from nonworking TANF families.

10. In the sample, about 85% of IPV was reported on the same day as the reporting date.

11. One exception is Texas which does not provide information on whether the incident happened on the same day as the reporting date or previously.

C. Empirical Model and Summary Statistics

An ideal dataset would differentiate between victims who receive TANF and victims who do not. It would also provide detailed personal and demographic information about offenders and victims, as well as other sources of income for TANF recipients. If instrumental violence is a dominant effect, there would be more family violence in a working family shortly after receiving a paycheck. If the paycheck is issued on the same day as the TANF transfer, then any estimate of the effect of TANF payments on domestic violence would include this paycheck effect, and hence be biased.

Employees receive paychecks at different times, depending on the employer, but generally they are paid weekly, biweekly, twice a month, or monthly. Weekly or biweekly payments are correlated with particular days of the week, so my analysis controls for day of the week. Monthly payments generally occur at the end of the month, so I control for a 3-day period around the end of the month. Twice-a-month payments generally occur in the middle and at the end of the month, so I also control for a 3-day period around the middle of the month. I assume that other payment timings are rare and independent from TANF timings.

I construct two types of IPV variables: intimidation and assault, which includes aggravated

assault and simple assault. The FBI's UCR Program defines aggravated assault as an attack with severe physical injury that is usually inflicted using a lethal weapon; simple assault is defined as an assault without a lethal weapon; intimidation is defined as a threat to cause physical harm without displaying a weapon. I limit study subjects to victims who are intimate partners of the offender; this includes spouses, common-law spouses, ex-spouses, and boyfriend-girlfriend pairs.[12]

The sample consists of 151 different agencies in 143 core cities in 21 states. The 21 states are Arkansas, Colorado, Connecticut, Iowa, Kansas, Louisiana, Maine, Montana, New Hampshire, North Dakota, Ohio, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, and Wisconsin. More than half (62.2%) of sample cities' data are for 2001–2009, while a small proportion (2.8%) of sample cities' data are for 2008–2009 (see Table 2 for the list of jurisdictions and time periods included in the analysis). In addition, I separate the 21 states into two groups by frequency of payment. Nonfrequent payment states pay once a month and may stagger payments among recipients, while frequent payment states pay recipients twice a month.

Table 3 shows the summary statistics for the nonfrequent payment sample and frequent payment sample. Average daily reports of IPV for the nonfrequent payment sample is 1.93 per 100,000 people, and 0.63 per 100,000 people for the frequent payment sample. Panel A shows the different rates of IPV by victim gender and victim-offender relationship. Average daily reports of female-on-male IPV are one-quarter of the average daily reports of male-on-female IPV, and therefore I focus on male-on-female IPV. For male-on-female IPV in the nonfrequent payment (frequent payment) sample, 64% (73%) of the victims are girlfriends, and 36% (27%) are wives or ex-wives. Panel B presents the type of male-on-female IPV. The most common offense between intimate partners is simple assault (Durose et al. 2005); assaults are reported 7–10 times as often as intimidation. To get a better picture of the degree of underreporting of intimidation and assault, we can compare police report data to victim survey data. For nonfatal IPV, 33% of female victims stated that they were physically attacked, and 67% of female victims stated that they were threatened with bodily harm,[13] according to the National Crime Victimization Survey for 2001–2005 (Catalano 2006). This suggests that verbal violence is underreported more often than physical violence.

The standard deviation of the daily count of IPV is greater than the mean of the daily count of IPV. This suggests that estimates derived from a Poisson model will lead to spurious inferences. I use a negative binomial model because its specification is robust to overdispersion (Aizer and Dal Bó 2009). The empirical model is:

$$DV_{st} = F\left(\lambda_{st},\ \theta\right) \tag{1}$$

$$\begin{aligned}\ln\left(\lambda_{st}\right) = {} & \beta_0 + \beta_1 \textit{Dummy for Index} \geq 0 \textit{ and} \\ & < 4_{st} + \beta_2 \textit{Dummy for Day } 30,\ 31,\ 1_t \\ & + \beta_3 \textit{Dummy for Day } 14,\ 15,\ 16_t + \alpha_s + \delta \textit{Month}_t \\ & + \gamma \textit{Year}_t + \sum_n \lambda_n H^n + \sum_m \lambda_m D^m + \varepsilon_{st}\end{aligned} \tag{2}$$

where s indicates agency and t indicates date. θ is the overdispersion parameter, and λ_{st} is the expected daily count of domestic violence by agency. $DV_{s,t}$ is the daily count of assault or intimidation of a female intimate partner reported by agency s. *Dummy for Index* ≥ 0 *and* $< 4_{st}$ is the dummy for the first 4 days since receiving the TANF transfer in each state. If the husband uses violence as a tool to extract money, I expect that more domestic violence, especially intimidation, will be reported on the delivery day. I chose the first 4 days since receiving the TANF transfer for two reasons. First, some states pay a portion of their recipients by mailing checks, which usually take 1–3 days to arrive. Second, a state with staggered payments does not have a single day in a month on which everyone has just received a welfare payment—that is, index is always greater than zero. See Appendix A in Appendix S1 for a detailed example.

Agency fixed effects (α_s) control for the time-invariant characteristics in each agency; for example, some police agencies are more vigilant when reporting domestic violence than others. Day-of-week fixed effects control for differences in domestic violence across days of the week. Year and month fixed effects capture yearly and monthly crime variation, including

12. In Texas, intimate partners are defined as spouses or common-law spouses.

13. Note that "threat of bodily harm" includes cases in which a weapon is brandished. In the NIBRS, intimidation is defined as the threat of bodily harm without displaying a weapon.

TABLE 2
Jurisdictions Included In the Analysis

Jurisdiction	Year in Sample	Jurisdiction	Year in Sample
Akron, OH	2001–2009	College Station, TX	2001–2009
Alexandria, VA	2004–2009	Corpus Christi, TX	2001–2009
Ames, IA	2002–2009	Danville, VA	2001–2009
Anderson, SC	2001–2009	Davenport, IA	2001–2009
Auburn, ME	2007–2009	Dayton, OH	2001–2009
Aurora, CO	2002–2009	Denver, CO	2005–2009
Abilene, TX	2001–2009	Des Moines, IA	2001–2009
Amarillo, TX	2001–2009	Dubuque, IA	2001–2009
Arlington, TX	2001–2009	Dallas, TX	2001–2009
Austin, TX	2001–2009	Easley, SC	2005–2009
Bend, OR	2005–2009	Elyria, OH	2005–2009
Bentonville, AR	2008–2009	Edinburg, TX	2001–2009
Bismarck, ND	2004–2009	El Paso, TX	2001–2009
Blacksburg, VA	2002–2009	Fargo, ND	2001–2009
Boardman, OH	2004–2009	Florence, SC	2001–2009
Bossier City, LA	2003–2009	Fond du Lac, WI	2006–2009
Bristol, TN	2001–2009	Fort Collins, CO	2006–2009
Broomfield, CO	2007–2009	Franklin, TN	2005–2009
Burlington, VT	2001–2009	Fort Worth, TX	2001–2009
Baytown, TX	2001–2009	Grand Forks, ND	2001–2009
Beaumont, TX	2001–2009	Grand Junction, CO	2001–2009
Brownsville, TX	2001–2009	Greeley, CO	2005–2009
Bryan, TX	2001–2009	Greenville, SC	2001–2009
Cedar Rapids, IA	2001–2009	Hampton, VA	2001–2009
Charleston, SC	2001–2009	Harrisonburg, VA	2002–2009
Charlottesville, VA	2001–2009	Hot Springs, AR	2002–2009
Chattanooga, TN	2001–2009	Harlingen, TX	2001–2009
Christiansburg, VA	2002–2009	Houston, TX	2001–2009
Cincinnati, OH	2001–2009	Iowa City, IA	2001–2009
Clarksville, TN	2001–2009	Jackson, TN	2001–2009
Cleveland, OH	2002–2009	Johnson City, TN	2001–2009
Colorado Springs, CO	2001–2009	Jonesboro, AR	2003–2009
Columbia, SC	2001–2009	Kingsport, TN	2001–2009
Columbus, OH	2003–2009	Knoxville, TN	2001–2009
Conway, AR	2002–2009	Killeen, TX	2001–2009
Corvallis, OR	2005–2009	La Crosse, WI	2008–2009
Council Bluffs, IA	2001–2009	Lawrence, KS	2001–2009
Cranston, RI	2004–2009	Lewiston, ME	2007–2009
Little Rock, AR	2002–2009	Round Rock, TX	2001–2009
Lynchburg, VA	2001–2009	Sioux City, IA	2001–2009
Laredo, TX	2001–2009	Sioux Falls, SD	2005–2009
Longview, TX	2001–2009	South Burlington, VT	2002–2009
Lubbock, TX	2001–2009	South Portland, ME	2005–2009
Mansfield, OH	2005–2009	Spartanburg, SC	2001–2009
Mauldin, SC	2005–2009	Stamford, CT	2005–2009
Medford, OR	2005–2009	Summerville, SC	2006–2009
Memphis, TN	2001–2009	Sumter, SC	2001–2009
Milwaukee, WI	2004–2009	San Angelo, TX	2001–2009
Missoula, MT	2005–2009	San Antonio, TX	2001–2009
Morristown, TN	2002–2009	San Marcos, TX	2001–2009
Murfreesboro, TN	2001–2009	Sherman, TX	2001–2009
Myrtle Beach, SC	2001–2009	Sugar Land, TX	2001–2009
McAllen, TX	2001–2009	Tacoma, WA	2007–2009
Midland, TX	2001–2009	Temple, TX	2001–2009
Mission, TX	2001–2009	Texarkana, TX	2001–2009
Nashua, NH	2005–2009	Tyler, TX	2001–2009
Nashville, TN	2001–2009	Virginia Beach, VA	2001–2009
New Haven, CT	2001–2009	Victoria, TX	2001–2009
New London, CT	2001–2009	Warren, OH	2008–2009
Newport News, VA	2001–2009	Warwick, RI	2004–2009
Norfolk, VA	2001–2009	Waterloo, IA	2001–2009
North Charleston, SC	2001–2009	West Hartford, CT	2007–2009
North Little Rock, AR	2003–2009	Wichita, KS	2001–2009
North Myrtle Beach, SC	2002–2009	Winchester, VA	2002–2009
Norwalk, CT	2001–2009	Waco, TX	2001–2009

TABLE 2
Continued

Jurisdiction	Year in Sample	Jurisdiction	Year in Sample
New Braunfels, TX	2001–2009	Wichita Falls, TX	2001–2009
Odessa, TX	2001–2009	Youngstown, OH	2004–2009
Portsmouth, VA	2001–2009		
Providence, RI	2006–2009		
Port Arthur, TX	2001–2009		
Radford, VA	2005–2009		
Rapid City, SD	2006–2009		
Richmond, VA	2001–2009		
Roanoke, VA	2001–2009		
Rock Hill, SC	2001–2009		
Rogers, AR	2008–2009		

TABLE 3
Summary Statistics for Intimate Partner Violence

	Daily Number of Offenses/100,000 People			
	Mean	Median	Std. Error	Fraction in (Sub)Category
For nonfrequent payment sample				
Panel A. All IPV	1.93	1.21	2.50	1.00
Male on female	1.54	0.90	2.06	0.80
Against wife	0.56	0.00	1.15	0.36
Against girlfriend	0.98	0.00	1.57	0.64
Female on male	0.39	0.00	0.93	0.20
Against husband	0.16	0.00	0.58	0.41
Against boyfriend	0.23	0.00	0.69	0.59
Panel B. Male on female				
Intimidation	0.19	0.00	0.66	0.12
Assault	1.34	0.65	1.89	0.88
Index	14.70	15.00	8.72	1.00
For frequent payment sample				
Panel A. All IPV	0.63	0.00	1.23	1.00
Male on female	0.51	0.00	1.08	0.81
Against wife	0.14	0.00	0.55	0.27
Against girlfriend	0.37	0.00	0.91	0.73
Female on male	0.12	0.00	0.51	0.19
Against husband	0.04	0.00	0.28	0.29
Against boyfriend	0.09	0.00	0.43	0.72
Panel B. Male on female				
Intimidation	0.05	0.00	0.30	0.09
Assault	0.47	0.00	1.04	0.90
Index	7.14	7.00	4.44	1.00

Notes: Data are reports of domestic violence to police agencies in NIBRS and are limited to incidents that occurred on the same day as reported to the police. Nonfrequent payment states pay once a month. Frequent payment states pay recipients twice a month. Sample jurisdictions are listed in Table 2. An intimate partner is defined as a spouse (including common-law spouses and ex-spouses) or a boyfriend/girlfriend. Violence includes intimidation and assault.

seasonal effects. H^n indicates a set of dummy variables for federal holidays. The indicator D^m represents the dummy for each day of the week. *Dummy for Day* $30, 31, 1_t$ is a paycheck dummy equal to one if the day equals to the 30th, 31st, or the 1st. *Dummy for Day* $14, 15, 16_t$ is another paycheck dummy equal to one if the day equals to the 14th, 15th, or 16th. Paycheck dummies capture the possible increase in domestic violence after receiving a paycheck. It also separates domestic violence between working couples and the majority of TANF recipients.[14]

Daily changes in demographic characteristics are subtle, and therefore I did not control for demographic data such as population, race, or

14. About 22% of recipients work, according to the 2010 national TANF file.

income, and instead relied on agency-level fixed effects to capture these variables.

Identification Strategy and Hypothesis. I test the instrumental violence hypothesis that the man uses violence to control the woman's behavior when the welfare transfer occurs. Formally, the hypothesis is as follows:

$$H_0: \beta_1 = 0; H_A: \beta_1 > 0$$

To identify the causal effect of the exogenous timing of TANF transfers on IPV, I control for the most likely paycheck timings, differentiating the paycheck effect from the TANF-based effect. Also, to avoid potential reporting bias, I only include those incidents that occur on the same day as the report.

V. EMPIRICAL RESULTS

A. Impact of the Timing of Welfare Payment on Domestic Violence

I estimate the effects of the timing of TANF payments on domestic violence using the empirical strategy described in the previous section. I include day-of-week, year, and month fixed effects. The dependent variable is the number of reports of these two types of domestic violence, and the unit of observation is an agency-day cell.

Table 4 presents the estimated effects of the timing of welfare transfers on the two types of IPV using a negative binomial regression with incidence rate ratio (IRR) in brackets. I find that the evidence supports the hypothesis that the husband uses violence as an instrument to control the household's resource distribution shortly after receiving the TANF transfer. It suggests that more females report IPV within 4 days of receiving welfare transfers. Specifically, in columns (1) and (2), the estimated IRRs for *Dummy for Index ≥0 and <4* are greater than 1 and significant under intimidation and assault. The IRR of *Dummy for day 30, 31, 1* is significantly greater than 1 under intimidation, suggesting a positive relationship between the timing of paychecks and intimidation (column 1). The IRR suggests that, in the first 4 days after receiving welfare transfers, reports of women being intimidated by their intimate partner increase by a factor of 1.046; reports of women being assaulted by their intimate partner increase by a factor of 1.007. Appendix B in Appendix S1 further discusses the estimated effect of welfare payments on IPV for the TANF population specifically.

B. Impact of Frequent, Small Welfare Payments on Domestic Violence

To test whether the frequency of the transfer has an impact on domestic violence, I interact the *Dummy for Index ≥0 and <4* and a dummy variable *Frequency* that equals to one in states that pay recipients twice a month. Table 4 shows the results in columns (3) and (4). In the first 4 days after receiving welfare transfers, women report more intimidation by a factor of 1.05 in the nonfrequent payment states. This effect of welfare payments decreases by a factor of 0.755 when the state pays twice a month. In other words, during the first 4 days after receiving welfare payments, women report intimidation 21% less often in frequent payment states. The effect of welfare payments on assault is smaller than on intimidation in nonfrequent payment states, and there is insufficient evidence to suggest a difference between frequent payment and nonfrequent payment states in this regard.

This implies that instrumental violence ceases to be the dominant effect when the transfer is rationed out in smaller, more frequent amounts. Using threats as a way to extract money from the wife is no longer worthwhile for the husband because the money is too little to fight over at any one time.

C. Additional Specifications

In this section, I test alternative specifications and perform robustness checks. First, to obtain empirical evidence that the main result is robust to changes in the specification of the index dummy, I perform a sensitivity analysis by investigating the linear relationship between the payment-timing index and domestic violence. Second, I address the concern that IPV reports from the entire population may not be representative of IPV victims who receive TANF by testing to determine whether variations by state in the TANF recipient ratio alter my analysis. Third, I test an alternative explanation for these results—namely, that TANF recipients use TANF money to buy alcohol and drugs, which fuels expressive violence—by restricting the dependent variable to only include IPV committed by sober offenders. Lastly, I conduct a placebo test by randomly assigning the value of *Dummy for Index ≥0 and <4*.

Sensitivity Analysis. The specification in Table 4 investigates the relationship between the near-delivery-day dummy and domestic violence. In

TABLE 4
Timing of TANF Payments and IPV

	Intimidation (1)	Assault (2)	Intimidation (3)	Assault (4)
Dummy for index ≥ 0 and <4	0.045***	0.007*	0.049***	0.007*
	(0.011)	(0.004)	(0.011)	(0.004)
	[1.046]	[1.007]	[1.050]	[1.007]
Dummy for index ≥ 0 and <4*frequency			−0.282***	−0.033
			(0.068)	(0.033)
			[0.755]	[0.967]
Dummy for days 30, 31, 1	0.130***	0.004	0.131***	0.004
	(0.032)	(0.007)	(0.032)	(0.007)
	[1.139]	[1.004]	[1.140]	[1.004]
Dummy for days 14–16	0.020	−0.004	0.022	−0.004
	(0.015)	(0.006)	(0.015)	(0.006)
	[1.021]	[0.996]	[1.022]	[0.996]
Constant	−5.867***	−1.674***	−5.868***	−1.674***
	(0.101)	(0.084)	(0.101)	(0.084)
	[0.003]	[0.188]	[0.003]	[0.188]
Observations	420,608	420,608	420,608	420,608
Log likelihood	−127,514	−445,660	−127,511	−445,659

Notes: Dummy for index ≥0 and <4 equals to 1 if the average number of days since last receiving a welfare payment is less than 4 days. *Frequency* equals to one in the frequent payment sample. All regressions include various U.S. federal holiday dummies, day-of-week fixed effect, year fixed effect, month fixed effect, and agency fixed effect. The unit of observation is agency-day. Robust standard errors in parentheses are clustered by state, and IRRs are in brackets.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 5, I analyze the linear relationship between the payment timing index and domestic violence. The IRR in column (1) suggests that when the index increases by one, reports of intimidation decrease by a factor of 0.998. Results show that there is a small and negative linear relationship between days since the last welfare transfer and intimidation; there is no linear relationship, however, between days since the last welfare payment and physical violence.

Alternative Dependent Variable. The impact of welfare payment timing on IPV may differ among states, since each state has a different TANF recipient ratio; this ranges from 0.15% to 2.28% (Table 1). To determine whether variation in the TANF recipient ratio alters my analysis, I estimate the TANF-recipient-IPV count, which is the IPV count of the entire population times the monthly TANF recipient ratio (%) by each state. The monthly TANF recipient ratio is the monthly number of TANF recipients divided by the annual population in each state. Data on TANF recipients in each state come from the U.S. Department of Health & Human Services, and population data from the Population Division of the U.S. Census Bureau. Table 6 shows the estimation of Table 4 with TANF-recipient-IPV as the dependent variable. Estimated IRRs for the

TABLE 5
Linear Relationship between Timing of TANF Payments and IPV

	Intimidation (1)	Assault (2)
Index	−0.002***	0.000
	(0.001)	(0.000)
	[0.998]	[1.000]
Dummy for days 30, 31, 1	0.148***	0.005
	(0.036)	(0.007)
	[1.160]	[1.005]
Dummy for day 14–16	0.014	−0.005
	(0.016)	(0.005)
	[1.014]	[0.995]
Constant	−5.827***	−1.938***
	(0.123)	(0.087)
	[0.003]	[0.144]
Observations	420,608	420,608
Log likelihood	−127,513	−445,660

Notes: Index is the average number of days since last payment. Both regressions include various U.S. federal holiday dummies, day-of-week fixed effect, year fixed effect, month fixed effect, and agency fixed effect. The unit of observation is agency-day. Robust standard errors in parentheses are clustered by state, and IRRs are in brackets.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Dummy for Index ≥ 0 and < 4 are similar to those in Table 4.

Alcohol/Drug-Fueled Expressive Violence Test. In addition to instrumental violence theory, there

TABLE 6
Timing of TANF Payments and Estimated TANF-Recipient IPV

	Intimidation (1)	Assault (2)
Dummy for index ≥ 0 and <4	0.048***	0.009***
	(0.010)	(0.003)
	[1.050]	[1.009]
Dummy for days 30, 31, 1	0.144***	0.006
	(0.024)	(0.007)
	[1.155]	[1.006]
Dummy for days 14–16	0.021	−0.001
	(0.015)	(0.006)
	[1.021]	[0.999]
Constant	−5.861***	−1.873***
	(0.226)	(0.243)
	[0.003]	[0.154]
Observation	420,608	420,608
Log likelihood	−153,131	−492,478

Notes: The dependent variable is the estimated count of TANF-recipient IPV, which is calculated as the counts of IPV times the TANF participation ratio. Dummy for Index ≥0 and <4 equals to 1 if the average number of days since last receiving a welfare payment is less than 4 days. Both regressions include various U.S. federal holiday dummies, day-of-week fixed effect, year fixed effect, month fixed effect, and agency fixed effect. The unit of observation is agency-day. Robust standard errors in parentheses are clustered by state, and IRRs are in brackets.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

TABLE 7
Timing of TANF Payments and IPV with Sober Offenders

	Intimidation (1)	Assault (2)
Dummy for index ≥ 0 and <4	0.040***	−0.002
	(0.010)	(0.005)
	[1.041]	[0.998]
Dummy for days 30, 31, 1	0.143***	0.004
	(0.037)	(0.007)
	[1.154]	[1.004]
Dummy for days 14–16	0.021	−0.005
	(0.015)	(0.005)
	[1.021]	[0.995]
Constant	−6.017***	−1.805***
	(0.107)	(0.090)
	[0.002]	[0.165]
Observations	279,657	279,657
Log likelihood	−111,293	−318,115

Notes: Dummy for Index ≥0 and <4 equals to 1 if the average number of days since last receiving a welfare payment is less than 4 days. Both regressions include various U.S. federal holiday dummies, day-of-week fixed effect, year fixed effect, month fixed effect, and agency fixed effect. The unit of observation is agency-day. Robust standard errors in parentheses are clustered by state, and IRRs are in brackets. Data from Texas were excluded due to lack of information on the offender's sobriety.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

may be other explanations for why IPV increases around the time of a welfare transfer. For instance, IPV could be triggered by additional alcohol or drug consumption when a welfare payment increases the abuser's income. To test this alternative explanation of alcohol/drug-fueled expressive violence, I restrict the dependent variable to include only IPV committed by sober offenders.[15] Within this sample, 90.17% of intimidation offenses are committed by sober offenders, and 82.59% of assaults are committed by sober offenders. Results are reported in Table 7. In the first 4 days after receiving welfare transfers, females report more intimidation by their sober intimate partners. The IRR (1.041) is similar to the IRR (1.046) in Table 4. However, the effect of welfare payments on assault by sober intimate partners is not significant. This suggests that receipt of a TANF transfer leads to more alcohol/drug-based physical IPV, which lends credence to a strong expressive violence effect.

At the same time, the increase in sober intimidation is strong evidence of instrumental violence. This result highlights the behavioral differences between instrumental and expressive violence. The former is a strategic negotiating tactic, which if successful does not require physical violence; the latter, in contrast, is an expression of emotion, which can be exacerbated by drugs and alcohol. This result is consistent with a model of asymmetric information in household bargaining (Bobonis, González-Brenes, and Castro 2013).

Placebo Test. To determine whether a causal relationship exists between the timing of welfare payments and IPV, I randomize the value of the *Dummy for Index ≥0 and <4* and estimate its effects on domestic violence for the whole sample. I find no evidence that the randomized timing of welfare payment has any effect on either IPV measure.

VI. CONCLUSION

I examine the effect of the timing of TANF transfer payments on reports of IPV, specifically intimidation and assault. By analyzing patterns of domestic violence in 151 core-city police agencies over the course of TANF transfer

15. This information is available in the NIBRS, but not in the Family Violence Report from Texas Dept. of Public Safety. Therefore, I exclude the State of Texas in Table 7.

payments in 21 states, I find a causal relationship between timing close to welfare payments and IPV against women.

Using NIBRS crime data and the TANF payment schedule, I provide empirical evidence to support the hypothesis that the husband uses intimidation as an instrument to control household resources. When I restrict the analysis to sober offenders, I find no evidence that physical violence increases right after the welfare payment, which suggests that the increase in male-on-female physical assault around the time of welfare payment is associated with alcohol use.

Taking advantage of differences in transfer frequency among states, I interact the dummy variable representing the time near TANF delivery date and the dummy variable representing frequent payment states. Results suggest that a smaller, more spread-out welfare transfer does not motivate the husband to use verbal violence to control the household resource allocation. However, there is not enough evidence to suggest that the effect of welfare payments on assault decreases in frequent payment states. I conjecture that increasing the frequency of welfare payments could mitigate the welfare payment effect on intimidation. However, this analysis does not rule out the possibility that increasing the frequency of payments could lead to more frequent incidences of alcohol-fueled physical violence.

For policy makers, this study offers insights on policy design regarding the prediction and reduction of domestic violence. It will also assist police, shelters, and hospitals to efficiently assign workers over the cycle of welfare payment to accommodate potential increases in domestic-violence reports and battered victims.

REFERENCES

Aizer, A. "The Gender Wage Gap and Domestic Violence." *American Economic Review*, 100(4), 2010, 1847–59.

———. "Poverty, Violence, and Health: The Impact of Domestic Violence During Pregnancy on Newborn Health." *Journal of Human Resources*, 46(3), 2011, 518–38.

Aizer, A., and P. Dal Bó. "Love, Hate and Murder: Commitment Devices in Violent Relationships." *Journal of Public Economics*, 93(3–4), 2009, 412–28.

Angelucci, M. "Love on the Rocks: Domestic Violence and Alcohol Abuse in Rural Mexico." *The B.E. Journal of Economic Analysis & Policy*, 8(1), 2008, 1–41.

Bloch, F., and V. Rao. "Terror as a Bargaining Instrument: A Case Study of Dowry Violence in Rural India." *American Economic Review*, 92(4), 2002, 1029–43.

Bobonis, G. J., M. González-Brenes, and R. Castro. "Public Transfers and Domestic Violence: The Roles of Private Information and Spousal Control." *American Economic Journal: Economic Policy*, 5(1), 2013, 179–205.

Card, D., and G. B. Dahl. "Family Violence and Football: The Effect of Unexpected Emotional Cues on Violent Behavior." *Quarterly Journal of Economics*, 126(1), 2011, 103–43.

Catalano, S. M. *Intimate Partner Violence in the United States*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2006.

Cormier, M. "Domestic Violence Occurrences and the Timing of Welfare Payments." M.A. dissertation, University of Ottawa, 2009.

Durose, M. R., C. W. Harlow, P. A. Langan, M. Motivans, R. R. Rantala, and E. L. Smith. *Family Violence Statistics: Including Statistics on Strangers and Acquaintances*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2005.

Eswaran, M., and N. Malhotra. "Domestic Violence and Women's Autonomy in Developing Countries: Theory and Evidence: Domestic Violence and Women's Autonomy." *Canadian Journal of Economics/Revue Canadienne D'économique*, 44(4), 2011, 1222–63.

Farmer, A., and J. Tiefenthaler. "Domestic Violence: The Value of Services as Signals." *American Economic Review*, 86(2), 1996, 274–79.

Felson, R. B., and S. F. Messner. "The Control Motive in Intimate Partner Violence." *Social Psychology Quarterly*, 63(1), 2000, 86.

Foley, C. F. "Welfare Payments and Crime." *Review of Economics and Statistics*, 93(1), 2011, 97–112.

Heath, R. "Women's Access to Labor Market Opportunities, Control of Household Resources, and Domestic Violence: Evidence from Bangladesh." *World Development*, 57(May), 2014, 32–46.

Hidrobo, M., and L. Fernald. "Cash Transfers and Domestic Violence." *Journal of Health Economics*, 32(1), 2013, 304–19.

Kimerling, R., and N. Baumrind. "Intimate Partner Violence and Use of Welfare Services among California Women." *Journal of Sociology & Social Welfare*, 31, 2004, 161.

Lundberg, S., and R. A. Pollak. "Separate Spheres Bargaining and the Marriage Market." *Journal of Political Economy*, 101(6), 1993, 988–1010.

Lundberg, S., R. A. Pollak, and T. J. Wales. "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit." *Journal of Human Resources*, 32(3), 1997, 463.

Macmillan, R., and R. Gartner. "When She Brings Home the Bacon: Labor-Force Participation and the Risk of Spousal Violence against Women." *Journal of Marriage and the Family*, 61(4), 1999, 947.

Manser, M., and M. Brown. "Marriage and Household Decision-Making: A Bargaining Analysis." *International Economic Review*, 21(1), 1980, 31.

McElroy, M. B., and M. J. Horney. "Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand." *International Economic Review*, 22(2), 1981, 333.

National Center for Injury Prevention and Control. *Costs of Intimate Partner Violence against Women in the United States*. Atlanta, GA: Centers for Disease Control and Prevention, 2003.

Pollak, R. A. "Bargaining Power in Marriage: Earnings, Wage Rates and Household Production." Working Paper No. w11239. National Bureau of Economic Research, 2005.

Rubalcava, L., G. Teruel, and D. Thomas. "Investments, Time Preferences, and Public Transfers Paid to Women." *Economic Development and Cultural Change*, 57(3), 2009, 507–38.

Stephens, M. "'3rd of Tha Month': Do Social Security Recipients Smooth Consumption Between Checks?" *American Economic Review*, 93(1), 2003, 406–22.

Tauchen, H. V., A. D. Witte, and S. K. Long. "Domestic Violence: A Nonrandom Affair." *International Economic Review*, 32(2), 1991, 491.

Tolman, R. M., and D. Rosen. "Domestic Violence in the Lives of Women Receiving Welfare Mental Health, Substance Dependence, and Economic Well-Being." *Violence Against Women*, 7(2), 2001, 141–58.

Zawitz, M. W. "Domestic Violence: Violence between Intimates." Special Report No. NCJ-149259, Bureau of Justice Statistics, US Department of Justice, Youth Violence Policy, Washington, DC, 1994.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Calculation, interpretation, and robustness check