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ABSTRACT

A long-standing debate concerns the rationality of slave owners and this paper addresses that debate within the context of manumission. Using a new sample of 19th-century Virginia manumissions, I show that manumission was associated with the productive characteristics of slaves. More productive slaves were manumitted at younger ages than less productive slaves. Although more productive slaves were more valuable to slave owners, which might be expected to delay manumission, more productive slaves faced more attractive labor market opportunities outside slavery, which elicited greater effort within slavery in order to buy their way out of slavery. Further, this paper addresses three important and two emergent literatures: the economics of slavery; the economics of stature; and the economics of complexion. The results reveal that height, complexion, and sex were the principal determinants of age at manumission.

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"Slaves are devils, and to make them otherwise

than slaves will be to set devils free."

-- Landon Carter[1]

INTRODUCTION

More than two centuries after he wrote "that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness," Thomas Jefferson's words still strike a deep chord with many Americans. That Jefferson could personally reconcile the contradiction between his self-evident truth and slave holding has confounded generations of historians and biographers.[2] The contradiction becomes even starker when judged against the acts of several prominent contemporaries, such as Robert Carter III, Richard Randolph (related to Jefferson by marriage), and George Washington who among them manumitted more than 1,000 slaves. Jefferson manumitted just eight of the approximately 200 slaves that worked his plantation during his lifetime. Jefferson, however, was not alone in championing white liberty and black slavery. [3] Carter, Randolph and Washington were the anomalies. Jefferson's was mainstream thinking on manumission.[4] Still, his reluctance to manumit does not sit well with political historians.

An explanation for Jefferson's (and other's) reluctance to manumit is not based strictly on economic self-interest. Fogel and Engerman (1974) estimated that the breakeven age for male slaves

[1] Quoted in Turtle (1991, p. 65).

[2] The number of Jefferson biographies that wrestle with his reconciliation of slavery and contemporary views on liberty are too numerous to cite. For brief and cogent treatments, see Stanton (1993) and Finkleman (1993).

[3] John Marshall freed only one of the 90 slaves he owned at his death. George Mason, who spoke against slavery at the constitutional convention, never liberated a single slave. Patrick Henry's will permitted his wife to free, if she chose, just one or two of his 100 slaves; the rest were to pass to his children.

[4] In the sake of expositional clarity I use "emancipation" to mean granting freedom to all one's slaves, such as Carter's choice to free every slave on his plantations, and "manumission" to mean the selective freeing of one or a few slaves. It was not uncommon for contemporary Americans to use the terms interchangeably.

raised from birth was 26 years. Manumission prior to that age implied a capital loss for the slave owner; manumission after age 26 was "philanthropy at bargain prices." Despite its relatively low cost, slave owners engaged in relatively little charitable manumission and became increasingly reluctant to do so as the antebellum era wore on. The odds that a slave might attain his freedom through manumission dropped from about one in ten in the 1790s to about two in one hundred in the 1850s. Moreover, prominent white slave owners were not the demographic that generally engaged in acts of charity. Babcock (1974) found that the average manumitting slaveholder owned less than 10 slaves, freed an average of three slaves, and rarely expressed religious or moral arguments for having done so. Kotlikoff and Rupert's (1980) study of Louisiana reveals that free blacks, not wealthy whites, were the majority manumitting group. Jefferson then was the bellwether not only of his own, but for two or three subsequent generations of slave owners.

Four recent studies of manumission revisit the motivations of manumitters. Cole (2005) found that some Louisiana slave owners profited from manumitting certain slaves. Using a reduced-form hedonic pricing model, he showed that a slave who purchased his own freedom paid an average 19 percent premium over the market price: hardly philanthropy. In his study of manumission in rural Virginia Budros (2004) found that movements in slave or commodity prices influenced the willingness of slave owners to manumit slaves. Finally, Whitman (1997) and Wolf (2006) contended that selective manumission was the product of ongoing negotiations between slaves and slave owners over the terms under which slaves labored. Rather than a product of antislavery ideology, selective manumission reinforced slavery by providing slaves with incentives to behave and work hard. In their focus on slave agency, Whitman and Wolf's interpretations are consistent with Findlay's (1975) model of slavery in which manumission was used as a mechanism to mitigate agency and monitoring problems inherent in most labor arrangements.[5]

This study uses a newly constructed data set on the characteristics of manumitted slaves to investigate the extent to which manumission was determined by a slave's observable characteristics.

[5] Under slavery, with its reliance on coercion, the agency problem is particularly pronounced (Acemoglu and Wolitzky 2009).

Ordinary least squares (OLS) and slave-owner fixed effects (FE) regressions reveal that taller slaves, male slaves and mixed-race or light-complected slaves were manumitted at earlier ages than others. These findings imply that more productive slaves were better able to extract themselves from the bonds of servitude than less productive slaves. Contrary to contemporary concerns that liberal manumission laws would lead slave owners to divest themselves of feeble, incompetent, aged or otherwise unproductive slaves that would become a charge on the county poor house, slave owners manumitted able-bodied, productive slaves. But manumitting more productive slaves at earlier ages suggests that manumission was not an act of charity, but rather a profit-maximizing strategy, one that elicited effort and good behavior. More productive slaves effectively purchased their freedom at earlier ages, even though the liberation of a productive slave implied a greater loss of capitalized rent. Although the data do not allow an independent test of Cole's finding that slave owners charged premium prices for manumitted slaves, the findings presented below are consistent with it.

MANUMISSION LAW IN VIRGINIA

A fundamental attribute of property is how owners may dispose of it. At common law property is freely alienable – it may be freely transferred by sale or gift – or not. Certain types of property are inalienable to some degree and the law and economics literature offers efficiency and equity explanations for inalienability rules (Calabresi and Melamed 1972; Rose-Ackerman 1985). Slaves were freely salable, of course, but most states imposed statutory restrictions on transfers by gift, particularly gratuitous transfers to the slave himself. Even when not prohibited by statute, the common law struggled with the notion of transferring a property right in the slave to the slave. In 1838 Justice Tucker of Virginia's high court expressed a widely held opinion that manumission by will or deed was not like any other property transfer. At law a slave was a thing not a person, and therefore had no right to acquire property, not even in himself. "Manumission is not strictly a gift of

property," he wrote. "It is the exoneration of a human being from the bonds which our institutions have fastened upon him."[6]

In restricting manumission, southern legislators and jurists recognized a fundamental conflict between a slave owner's right to dispose of his property as he saw fit and the state's security or other interests (Schiller 1992, p. 1228). To many white southerners, one master's decision to manumit had large, negative external effects. One contemporary bluntly observed that "Whoever manumits a slave may be inflicting the deadliest injury upon his neighbors" (quoted in Turtle 1991, p. 39).[7]

Despite substantial opposition to manumission, several arguments were provided in its favor. First, slavery was antithetical to the values of a republic. In the 1780s and 1790s when the debate over manumission peaked, Americans had just struggled through a long and difficult war to ensure their own liberties and many recognized the deep irony that some of the most vocal advocates of liberty were slave owners.[8] Second, slavery was antithetical to the values of a Christian republic. Although Old Testament passages were marshaled in support of slavery, Quakers, Methodists and, for a brief time, Baptists condemned slavery as inconsistent with church doctrine.[9] Third, the collapse of the post-Revolutionary tobacco economy made slavery unprofitable. Fourth, an emergent liberal, laissez faire philosophy held that any restraint placed on a slave owner's freedom to dispose of property as he saw fit was unacceptable, regardless of whether that restraint restricted manumission or required general emancipation (Wolf 2006, p. 35). Finally, supporters of liberal manumission believed that selective manumission reinforced slavery. As a general rule, manumission rewarded one or two favored slaves for dutiful service. The hope of future manumission encouraged

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[6] *Parks v. Hewlett*, 9 Leigh 511 (Va. 1838), quoted in Russell (1913, p. 46). Schafer (1994) investigates how Louisiana courts struggled (not always consistently) with the legal dichotomy of slaves as person and slaves as property.

[7] Wahl (1997) also discusses the limitations placed on slaveholders in the context of externalities.

[8] Samuel Johnson's comment "how is it that we hear the loudest *yelps* for liberty among the drivers of negroes?" is commonly repeated (quoted in Finkleman 1993, p. 192). The contradiction was not lost on contemporary southern slave owners either.

[9] When the Methodists met in Baltimore in 1784 to form the Methodist Episcopal Church, one of their first acts was to order all members to free their slaves. Although ministers met resistance to this demand, many Methodist slave owners did liberate slaves. By the first decade of the nineteenth century, the Methodists abandoned the manumission requirement. The Quakers remained steadfast in their commitment to emancipation and excommunicated slave owners (Turtle 1991, pp. 56, 79-80).

enslaved people to behave well and work hard. Although the odds were long – about one in ten in the 1790s, increasing to about two in one hundred in the 1850s – the likelihood of manumission may have been high enough to encourage servility and effort in a majority of slaves (Budros 2004).

After more than a century of heavily regulated manumission that verged on prohibition, Virginia adopted a liberal private manumission law in 1782 that allowed private manumission free of governmental approval. To be legal the instrument of manumission had to be signed, proved in a county court, and made a matter of public record (Ballagh 1902). The substantive remaining restrictions included that slaves had to have attained their majority (18 years for women, 21 for men) and be less than 45 years old, unless the slave owner posted a bond in the event that the freed slave might become a charge on the county poor role. The act also made manumittors financially responsible for any manumitted slave who proved unable to fend for him or herself. Finally, the law required manumitted slaves to obtain and carry copies of their manumission or freedom papers (Wolf 2006).

The era of liberal private manumission ended in 1806. For reasons that are not fully understood, the law reverted back to the pre-1782 regime.[10] Slave owners retained the right to manumit slaves by will or deed, but the new law required freed slaves to emigrate from the state within twelve months of attaining their freedom (Ballagh 1902; Wolf 2006). If any liberated slave remained beyond the 12-moth grace period, overseers of the poor were to take him into custody, sell him back into slavery, and use the proceeds in support of the poor of the county. Under the 1806 law the legislature retained the right to grant waivers to the emigration requirement, but only for slaves who had demonstrated some "extraordinary merit."

Russell (1912) contended that public debate over manumission died down after passage of the 1806 act for two reasons. First, a strictly enforced emigration requirement represented a compromise between that part of the electorate opposed to liberal manumission and that part that

[10] Reasons given range from vague "public concerns" (Turtle 1991) to concerns over the increasing size of the free black population (Russell 1912). It may have also been a delayed response to Gabriel's Revolt in 1800 and fears that too many kindnesses had been shown to slaves.

supported a slave owner's prerogative to liberate one or more slaves if his conscience demanded it. Second, the law embraced an emergent colonization movement. Emigration by way of colonization offered a way to limit the growth in the free black community even with manumission.

The law was amended twice more. In 1815 the right to grant waivers to the emigration requirement was transferred from the legislature to the county courts. The courts' ability to grant permission to remain in the state after manumission was conditioned on extraordinary merit. Finally, in 1819 the law was further amended so that viable candidates for the waiver needed to demonstrate a specific act of extraordinary merit and show that they were "sober, peaceful, orderly and industrious" (Ballagh 1912, p. 125). Because permitting former slaves to retain Virginia residence affected the public at large, notice of application had to be posted at the courthouse for five weeks and receive the endorsement of the states' attorney. Rejections of a requested waiver could not be appealed and the right to remain could be revoked at any time for cause (Wolf 2006, p. 134).

As with many other nineteenth-century black codes, there is evidence that manumittors, former slaves and county officials simply ignored the emigration and extraordinary merit provisions in the 1806, 1815 and 1819 acts. Russell (1912, p. 156) estimated that by 1860 between one-quarter and one-third of Virginia's free blacks resided in the state illegally. Even when the law was observed, the extraordinary merit requirement was so broadly interpreted as to be meaningless. Jackson (1930) also concluded that the deterrent effect of the 1806, 1815 and 1819 laws were minimal. He finds that, for the city of Petersburg at least, the manumission rate between 1820 and 1865 was not much below that prior to 1806. Moreover, nearly every request for permission to remain was granted. Because manumission was unrestricted in Virginia between 1782 and 1806 and relatively unrestricted between 1819 and the Civil War, the commonwealth provides a useful laboratory for the study of manumission.

ECONOMICS OF MANUMISSION

Any economic explanation of manumission needs to address both the demand for and supply of manumission. Slaves were not without agency and modern interpretations of slavery emphasize (overemphasize at times, perhaps) that "slaves wrested freedom from their masters in a bewildering variety of power struggles … mixtures of exploitation and kindness, and long, patient bargaining interspersed with violent episodes." Findlay (1975) offered a model of manumission that connects the proportion of a slave's life spent in slavery with his or her productivity and the agency costs of monitoring his or her actions. Although he assumed that masters elicited effort (and mitigated shirking) through a combination of incentive payments and coercion, he focused on incentives schemes, emphasizing the idea that slaves achieved freedom through saving and self-purchase. As useful as Findlay's model is, it models only the master's choice calculus and reduces the slave's calculus to his or her choice of the fraction of current earnings that will be saved and put toward future self-purchase. In other words, Findlay's model emphasizes the supply of manumission (masters' choices), but largely ignores the demand for manumission (slaves' choices).[11]

Findlay's (1975) model assumes explicit payments made to slaves by masters and that slaves could and would save some fraction of those payments to purchase their freedom. The historical record reveals that these are not unreasonable assumptions. Slaves earned incomes, accumulated savings and purchased their freedom when the amounts they saved were enough to compensate their masters for the loss of future income.[12] Whitman (1997, p. 50) reported that the Maryland Chemical Works in Baltimore paid slaves 50¢/week base salary plus 25¢/day for extra late-night or Sunday

[11] The decision to emphasize the supply side was reasonable in 1975 because the academic slavery literature had not yet embraced the idea that slaves retained some agency even within the peculiar institution. Since at least the publication of Genovese (1972) and Blassingame's (1979) classic books, the treatment of slaves within slavery has evolved from one portraying them as passive victims to workers with varying abilities to negotiate the terms and conditions under which they lived and labored and achieved freedom, whether through self-purchase or flight (Genovese 1974; Whitman 1997; Franklin and Schweninger 1999; Martin 2004; Wolf 2006).

[12] Masters recognized the importance of the incentive effects created through payment, savings and the possibility of self-purchase. In *Waddill v. Martin* 3 Ired. Eq. 562 (N.C. 1845) the North Carolina Supreme Court determined that the slaves of a testator could continue with their long-established practice of keeping profits from the cotton they grew on their own plots. The court refused to distribute these funds as part of the testator's estate. In separating the slave's savings and recognizing them as creditors of the estate, the court recognized the importance of incentive payments and the necessity of enforcing agreements between slave holders and slaves. If slaves learned that their savings were unprotected and the savings agreements unenforceable, the entire system of promising rewards for extra effort might have collapsed.

work. Whitman estimated that a slave might purchase his time within a reasonably brief period by saving about one-third of this income. Babcock (1974) found that 10% of Virginia manumission papers acknowledged that slaves had purchased their freedom and Cole (2005) found that nearly 20% of slaves manumitted in French New Orleans purchased their own freedom.[13] Self-purchase represented a viable path to freedom for more than a few slaves.

What about slaves that wanted to purchase their freedom, but worked for a master who refused to make incentive payments or hold a slave's accumulated savings. Whitman (1997, pp. 127-129) documents the emergence of manumission brokers in 19th century Maryland. Effectively, brokers were slave owners who made a market in manumission through purchasing slaves, working them for a period at high capacity, and then freeing them. A slave desirous of purchasing his freedom could approach one of these brokers and offer a term of diligent and faithful service in return for having the broker purchase the slave from the slave's current owner. Once a mutually agreeable price was established for the slave, the broker established the term (or length) of service owed him by the slave in recompense. A deed recording the agreement, which legally bound the broker to free the slave at a future date, was filed with a county court. Once the slave labored for the agreed-upon period, he was freed. If the slave failed to make good on his promise of diligent and faithful service, the manumission broker held an ownership right (the ultimate collateral, perhaps) and might sell him to any third party willing to buy him.

As we have seen about 10 to 20 percent of manumitted slaves achieved freedom through self-purchase. Another 10 to 20 percent were manumitted after being purchased by another, often a family member who had previously attained his or her freedom (Jackson 1930; Cole 2005). After an early wave of such manumissions in the 1790s, relatively few slave owners freed slaves due to moral or religious misgivings. How then do we explain the majority of manumissions, most of which resulted from slave owner "affection" for the manumitted slave?

[13] In liberating slave Hubbard Winn, G. C. Johnson of Petersburg, Virginia recorded in his deed of manumission that "in consideration of the fact that by industry and economy he hath paid me out of his extra earnings, the full amount of the purchase price which I paid for him" (Jackson 1930, p. 307).

We can think of saving more broadly than an accumulated fund of money. Diligent and faithful service surely built up a stock of goodwill with slave owners. Especially dutiful slaves may have accumulated a stock of nonpecuniary wealth that could be exchanged for freedom once the balance grew sufficiently large. Cole (2005, p. 1015) contended that the high proportion of manumissions for "good service" suggests that incentive schemes were at work. Promises of manumission *in futuro* were surely made to elicit effort and were the result of extended negotiations between slave and slave holder.

Nor can we forget that some manumitted slaves were the offspring of the person granting them their freedom. Cole (2005) found that about 9% of liberators acknowledged paternity and Jackson (1930) noted several instances of light-complected, blue-eyed slaves with straight hair and Caucasian features being set free. As both Jackson and Kotlikoff and Rupert (1980) observed, these may have been the slave owner's offspring or it may have been that some slave owners were uncomfortable enslaving people that so closely resembled themselves.[14] In most cases, paternity must be inferred rather than concluded from the data. The remainder of this paper investigates the importance of several observable factors believed to have influenced manumission, including racial heritage, complexion, sex and height.

EMPIRICAL STRATEGY AND DATA

If we follow Findlay and denote t* as the age at manumission and T as the slave's expected lifetime, the ratio t*/T (the proportion of one's life spent in bondage) will be a function of the slave's productive characteristics, as well as personal and environmental features that influence the agency costs inherent in the slave labor relationship. To determine which characteristics influenced the fraction of life spent in slavery, two estimation techniques are employed. First, I estimate reduced-form ordinary least squares (OLS) regressions of the following form:

$$(1) \qquad \ln[(t^*/T) / (1-t^*/T)]_{ijct} = X_i'\beta + \gamma_c + \gamma_t + u_{ijct}$$

[14] Johnson (2000) provides narrative evidence of white discomfiture with the ownership of "white" slaves, or mixed-race slaves of unusually light complexions, even among staunch defenders of slavery.

Where X is a vector of slave-specific characteristics (discussed below); γ_c are county/city dummy variables; γ_t are dummy variables capturing the five distinct manumission regimes discussed in the previous section; and u_{ict} is the error term. The subscript i indexes the slave, j the master, c the county and t the relevant time (manumission regime). Because $0 \leq t^*/T \leq 1$ by construction, the dependent variable is transformed into a continuous variable as in the left-hand side of equation (1) above.

Second, because some masters manumitted several slaves and we lack many relevant slave owner characteristics, a slave owner fixed-effects approach will control for unobserved features of the master and, perhaps, some unobserved slave characteristics that may have differed across plantations but been similar within plantations. We cannot, for example, assume that the genetic component of ability will be the same across slaves manumitted by the same master (though we do know when some manumitted slaves are kin), but we might expect some productivity characteristics to have been determined by the master's choices during the master's ownership tenure. Rees et al (2003) developed a model of slave owner behavior in which the master optimizes lifetime productivity through the provision of nutrients at critical periods in the slave's life. Although not every slave was treated identically in practice, there were likely correlations across slaves within a plantation, so a fixed effect model of the following form estimates within-plantation variation in ages at manumission, which may also mitigate any potential simultaneity bias between the dependent and some of the independent variables:

$$\ln[(t^*/T) / (1-t^*/T)]_{ij} = X_i'\beta + \alpha_j + u_{ij} \quad (2)$$

Where α_j represents the planter fixed effect.

Some important characteristics of manumitted slaves are recorded in free black registers maintained by Virginia's county courts between 1793 and 1865. Under the terms of a 1793 act, every free-born or manumitted African American residing in the state was required to register with the clerk of the court in his or her county of residence. For a fee of 25¢ county clerks provided registrants with a copy of the registration, which served as the free person's freedom papers. Clerks

also kept ledgers containing information on each registrant. Although the Library of Virginia has thousands of the original registers in its archives, the source of the data used here is the clerk's ledgers, many of which have been photographed and are available on microfilm. Several have been transcribed and published by genealogists. Only a small fraction of the approximately 15,000 registrations surveyed were usable. The data appendix provides the details of the registrations and a list of sources.

Registrations typically included the name of the registrant, including any known aliases, his or her age, sometimes an explicit acknowledgment of the registrant's sex (but it is often inferred from first names), the registrant's height, race (black or mixed), complexion (dark, medium or light), any identifying scars, marks, tattoos or other distinguishing features, such as missing teeth, hair length, texture or color, and so on. Too few of the registers reported the registrant's occupation to make use of that information. The registrant's county of birth, in addition to county of residence, was consistently reported only after an 1850 amendment to the registration law required this information.

Because the model of manumission expresses the time spent in slavery as a function of the proportion of the slave's productive life (t*/T), one issue in translating the ratio into a usable variable is estimating a slave's expected productive lifetime. Assuming that a slave's productive life was some constant fraction of his or her life expectancy and that it was similar across slaves, it is possible to construct an estimate of t*/T using life tables. Eblen (1974) generated life tables for male and female slaves and reports life expectancy at 10-year intervals for ages between 0 and 70 (that is, he reports e_0, e_{10} , …, e_{70}). I calculate the ratio t*/T for each age interval for the relevant age-sex group: the expected proportion of life in slavery for children manumitted at less than 10 years, for example, is calculated using e_0; expected proportions for slaves between 10 and 19 years are calculated using e_{10}; and so on up through slaves in their seventies.

Table 1 provides definitions and summary statistics for variables included in the regressions.[15] Because the regressions are reduced-form it is difficult to disentangle features influencing the demand for and supply of manumission, but economic logic and historical accounts offer plausible interpretations. One potentially important determinant of time spent in slavery was a slave's height relative to the contemporary average, but the effect of height on time spent in slavery is ambiguous. Schultz (2002), Persico et al. (2004) and Case and Paxson (2008) argue that height represents a form of human capital that is rewarded in labor markets. Although the association between height and wages (and presumably productivity) in modern labor markets is believed to be mediated through a height-cognition effect, in the 19th century South it is likely that the height-productivity association followed from a taller slave's better health, greater strength and increased physical capacity for work.[16] If the assumed connection between height and productivity is correct, the effect of height is ambiguous because greater productivity made slaves more valuable to slave owners, who would have demanded higher prices for taller slaves.[17] But greater height would have made the slave more valuable to the slave himself because his option value outside slavery was higher. That owners might demand higher prices for taller slaves is expected to increase the proportion of a slave's life spent in slavery. On the other hand, the higher outside option value may have made taller slaves more willing to save to purchase their freedom. Moreover, if taller slaves were more productive they could generate more output out of which to save. Combined, these two factors may have decreased the proportion of life spent in slavery.

Given the physical labor requirements of 19th century agriculture, female slaves were less productive than males. Burnett (2007) reported the results of several studies that estimate that females, generally, were about two-thirds as productive as males in 19th-century agriculture and manufacturing and Olmstead and Rhode (2008) found a comparable productivity ratio in 19th century

[15] Of 863 registrations that met the criteria discussed in the data appendix, only 745 usable observations remained after dropping those with missing information on one or more key variables.
[16] Bodenhorn and Price (2009) show that an alternative anthropometric measure, namely the body mass index, was associated with 19th century labor market outcomes.
[17] Pritchett (1997) finds that taller slaves were positively selected into the interstate slave trade.

plantation cotton harvesting. Lower productivity implied a lesser ability to accumulate savings and a lower outside option for slave women.[18] Normally, a less productive slave would be less valuable to planters, which would lower the manumission buyout price, but the female/male price ratio (0.80-0.88) was greater than the wage ratio due to the child-rearing capacity of women up to age 40 (Kotlikoff and Rupert 1980). On the supply side, paternalism may have further reduced incentives to manumit women if planters recognized that single women, especially if manumitted with minor children, would be less able to provide for themselves in freedom. Alternatively, women were more likely to be employed in household or domestic service and to have developed a relationship, if not goodwill, with owners who may have responded by freeing them earlier.

In the case of mixed-race (mulatto) slaves, demand and supply side factors point toward earlier manumission.[19] Margo (1992) found that mulatto slaves on plantations were more likely than blacks to be skilled, which increased their productivity. They also faced better outside options given the racial and color-based preferences shown light-skinned and mixed-race freemen (Bodenhorn 2002). From the master's viewpoint, familial preferences for mixed-race slaves that may well have been their own offspring would likely have reduced time spent in slavery. A paternalism effect may have operated as well, if masters were genuinely concerned with a manumitted slave's ability to provide for him or herself in freedom because free mixed-race slaves tended to work in more lucrative occupations than free blacks. Unfortunately, the data do not afford a direct opportunity to separate productivity from paternalism.

It is possible to test the pure colorism effect in a sample that eliminates mixed-race individuals and considers complexion effects among blacks alone.[20] If the master's preference for light complexion resulted from familial ties, the experience of mixed-race slaves would be expected to differ from that of light-skinned blacks. Because the registers provided detailed descriptions,

[18] Bodenhorn and Ruebeck (2007) find that households headed by single black women had much less wealth than male-headed household, which implies that the outside option was less attractive.

[19] Whitman (1997, p. 95) contended that race played a small role in Maryland manumissions. He argued that mixed-race slaves were not disproportionately manumitted, but he does not report whether they were younger than black slaves at manumission. Preferences manifest themselves in other ways than ratios.

[20] Colorism is defined as prejudice or preference based solely on a person's skin color.

including fine color distinctions, it is possible to divide blacks into three complexion groups – light, medium, and dark (see notes to Table 2 for categorizations). The complexion effect is tested with a sample including only blacks with dummy variables for dark and light complexions.

Slaves achieved their freedom through three legal means: deed, will and court order. Matison (1948) contended that manumissions by will were more often acts of charity, while manumissions by deed were more often the result of self-purchase. Manumission through court order followed from a slave owner's effective breach of contract. Courts sometimes ordered slaves to be freed when heirs refused to abide by the terms of a will that instructed the executor to free the slave. In other instances, slave owners – often an owner other than the one who recorded a deed of manumission – refused to liberate a slave who had abided by the terms of the deed and should have been freed. Dummy variables for manumission by deed and manumission by court order are included in the regressions to capture any systematic differences between these paths to freedom (manumission by will is the excluded category).

The regressions also include a dummy variable to account for the sex of the slave owners (female =1). It is not immediately evident how the sex of the slave owner might influence the negotiations over manumission between slave and slave owner. Controlling slaves was a difficult business and both contemporaries and historians doubted the ability of women to administer a large plantation with an unruly labor force (Whitman 1997). Some female slave owners preferred to free disruptive males rather than struggle with them. To investigate whether young male slaves had some added advantage in obtaining their freedom from female slave owners, the regressions include an dummy variable for female slave owners interacted with adult male slave.

The regressions also include dummy variables for the five manumission regimes discussed earlier. Holding the demand for manumission constant through time, changes in the law shifted the supply of manumission. Slave owners who observed the law were bound by it and all the manumissions included in this sample observed the law in that the manumissions were recorded by the county clerk and were, therefore, known to the court. For those who wished to manumit

according to the law, changes in the law may have been a significant determinant of manumission practice. The sample includes manumissions recorded between 1792 and 1865 and this span is divided into five periods: 1792-1806 was the period of liberal manumission policy; 1807-1815 was the period of restrictive policy that required that the slave emigrate unless a waiver was issued by the legislature; 1816-1819 when issuance of waivers was transferred from the legislature to county courts, which should have reduced the cost of obtaining a waiver; 1820-1831 when the law was amended so that a waiver required court recognition of a particular meritorious act; and 1832-1865 is the period after the Nat Turner insurrection when public attitudes toward manumission hardened though the law remained unchanged.

RESULTS

The analysis proceeds in two parts. First, full sample OLS and fixed effects models are discussed. Second, mixed-race slaves are excluded from the sample to further investigate the extent to which complexion or color-based preferences influenced manumission decisions.

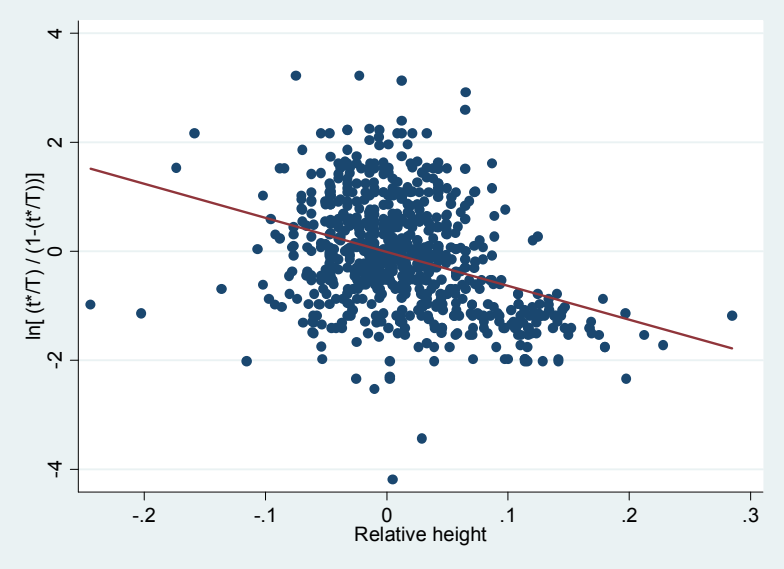
Full sample results

Table 2 reports coefficient estimates on the sample of 745 manumissions for which all independent variables are observed. The regressions include all the observable personal characteristics of the slave, the slave owners, the instrument of manumission, whether the slave was manumitted as part of a group or with family members, and the legal regime under which the manumission occurred (the excluded category is the period of liberal manumission between 1782 and 1806). Specifications in columns (3) and (4) also include county and city dummy variables to capture any systematic local influences, including possible contagion effects.[21] In all specifications, the

[21] An interesting possibility is that there may have been contagion effects. Decisions by one or a few prominent slave owners to manumit may have spilled over to friends and neighbors. I thank Bill Dougan for this observation.

standard errors are clustered on manumission groups because simultaneous manumissions are not independent observations.[22]

Figure 1: Simple OLS prediction of relative height on proportion of life spent in slavery



Given the results of the modern literature on the association between height (and other anthropometric measures) and labor market outcomes, the coefficients on the height variables are not surprising. In column (1) height enters linearly and the coefficient implies that taller slaves were able to extract themselves from the bonds of slavery at younger ages than shorter slaves. Figure 1 shows the scatterplot and the simple OLS prediction of relative height on the proportion of a slave's life lived in slavery. The scatterplot suggests the possibility of nonlinear effects of height on

[22] Clusters are for groups observed in the data. It is possible, even likely, that some slaves were manumitted as part of a group or family, but unless other members of the group or family appear in the registrations the slave is considered an independent observation.

manumission and columns (2) and (3) estimate a quadratic in relative height. The quadratic specifications suggest that the proportion of life in slavery was maximized for slaves with a relative height value of -0.07. Because relative heights ranged from -0.24 to +0.28 with a mean of 0.01, slaves considerably shorter than the average for their age and sex were liberated at later ages than taller slaves. Finally, column (4) allows relative height to enter as a nonlinear spline (based on quintiles of relative height) in the event that a quadratic or higher order polynomial specification inadequately captures any nonlinearities in the relationship between height and manumission.[23] The nonlinearity becomes apparent in the spline specification. Slaves in the two highest quintiles of relative height spent notably less of their lives in slavery than slaves in three lowest height quintiles.

The negative association between relative height and time spent in slavery accords with modern studies of height and labor market outcomes. Whether the association was mediated through a pure productivity effect (taller slaves were stronger and healthier with a greater capacity for physical labor than shorter slaves), a cognition effect (greater stature reflects better childhood nutrition and, therefore, greater cognitive development), or a socialization effect (taller slaves were shown preferences by masters, who developed personal relationships with these slaves and were more open to the possibility of manumitting them) is unknowable from the data. It may well have been a combination of all three factors. Ultimately, the notable feature is that height was associated with a labor market outcome in the nineteenth century, which suggests that the association uncovered in the late 20th century is not unique to that time. Rather, the association between height (and other anthropometric measures) is of long standing.[24]

A second notable association is that between a slave's race and the proportion of life spent in slavery. Mixed race slaves spent a significantly smaller proportion of their lives in slavery compared to blacks. Several recent studies document the occupational, wealth and health advantages of free mixed-race African Americans in the mid-19th century, and the result here suggests that the mixed-

[23] Spline models may be alternatively estimated with high-order polynomials, but polynomial models are difficult to fit to data unevenly spaced turning points (Marsh and Cormier 2002).

[24] Bodenhorn and Price (2009) found that brawnier individuals were at lower hazard of criminal behavior in the mid-19th century, which was likely a result of their better labor market opportunities.

race advantage operated even in slavery or, at least, the escape from slavery (Bodenhorn 2003; Bodenhorn 2006; Bodenhorn and Ruebeck 2007). Jackson (1930) and Kotlikoff and Rupert (1980) remained agnostic on the mechanism underlying the mixed-race slaves' advantages in the manumission market. The overrepresentation of light-skinned, mixed-race children and youth among the manumitted suggests white parentage. On the other hand, it may have been that white slaveholders had a harder time reconciling their consciences over slavery when the enslaved looked so much like the masters (Johnson 2000). Although Jefferson, for example, never revealed the criteria he used in selecting just eight of his slaves for manumission, it is telling that all eight were mixed-race and light-skinned. Sally Hemings was allegedly his mistress and some of those favored by Jefferson may have been his children by Hemings (Gordon-Reed 2008). Alternatively, Margo (1992) offers a potential productivity reason in that mixed-race slaves were more likely than blacks to work at skilled or semi-skilled jobs on plantations. Although they were more valuable to planters, skilled mixed-race slaves' greater earning capacity and more attractive outside options may have accelerated their time to manumission. Absent better information on each manumitted slave's occupation and paternity, the relative weights of the miscegenation and productivity effects will remain unknown.

Female slaves were manumitted later than males, though the effect is not particularly large. This result, Whitman (1997) contended, is noteworthy. Manumission outside the Chesapeake region was characterized by the disproportionate manumission of women, which is often interpreted as the consequence of sexual liaisons between masters and slave women. In Virginia, less than half of manumitted slaves were women and the regressions reveal that they were manumitted somewhat later in life than men. This result is largely consistent with Whitman's belief that slaves, as much as masters, were determining who gained freedom. Because males had better outside options they were better able to negotiate for freedom and better able to compensate their masters for the capital loss suffered through manumission.

The estimated coefficients on manumission regimes reflect changes in the supply of manumission. Although some Virginia slave owners ignored the law and set slaves free outside the

legal manumission process, the large negative coefficients on the 1816-1819 dummy indicate that the initial switch from legislative approval to county court approval of manumission requests may have been a more liberal regime than the 1782-1806 baseline regime. It may also reflect a rush to manumission if those slave owners most likely to manumit legally recognized that the law might prove short lived, which it was. That the coefficients on two of the regimes are large and statistically significant implies that manumission laws were observed in the main. Russell (1912) and Jackson (1930) characterized the laws as relatively toothless because they found that a sizeable proportion of the free black population resided in the state illegally. The counterfactual is difficult to test, but the results can be interpreted to mean that absent legal restrictions and growing public disapproval, manumission may have been more common and the free black population even larger than it was.

Fixed effects regressions – full sample

One concern with the OLS results is that the coefficients may exhibit simultaneity and omitted variable biases. Slave agency notwithstanding, masters exerted a great deal of influence over many aspects of slave life, including nutrition, housing, medical care, sexual relations (between masters and slaves and between slaves themselves), the gender makeup of the labor force, and so on. It is well known in the anthropometric literature that about 80% of attained adult height is driven by genetic factors, but the remaining 20% is driven by nutrition and health during the critical growing years (Silventoinen 2003). It is also well known that masters exerted enormous influence over the nutritional and health environment in which slaves lived (Fogel and Engerman 1974) and Rees et al (2003) developed a model in which slave owners knew that food affected physical growth, work capacity, and slave market value. They also had some production function and given the prices of food and output, they rationed food consistent with its marginal revenue product. If prices rose, it was optimal to provide more food to fuel greater work capacity. But child labor was not nearly as productive as adult labor so masters balanced the tradeoff between food as fuel for current output and food as investment toward future labor capacity (Steckel 2007). In the event that masters who

were more generous with food allotments were also more likely to be generous with manumission, height and manumission may be driven by unobserved common, planter-specific factors.

To account for possible simultaneity bias between height and age at manumission, a second set of regressions that include planter fixed effects are reported in Table 3.[25] The basic results of the OLS regressions appear in the FE regressions. First, taller slaves were manumitted earlier than shorter slaves. The quadratic specification in column 2 suggests that the maximum proportion of life spent in slavery occurred for slaves with a relative height equal to -0.15. Recalling that the average mean height was 0.01 and ranged between -.24 and +0.28, the FE estimates imply that slaves considerably below the contemporary norm were manumitted later in life. The quintile spline estimates in column 3 are consistent with the quadratic specification. Slaves in the two tallest quintiles spent a lower proportion of their lives in slavery. To the extent that height was positively associated with health, cognitive ability and physical capacity for work, the results suggest that taller slaves were able to negotiate for earlier release.

The other notable OLS results also stand in the FE regressions. Mixed-race slaves spent significantly lower proportions of their lives in bondage prior to manumission. Again, there is no way to sort out the competing miscegenation versus productivity explanations, but FE coefficients are interpretable as within-plantation effects so that whatever the explanation – sexual liaisons with slaves, preferential occupational training, or discomfiture with enslaving light-complected individuals with recognizable white ancestry – the effect was powerful at the level of the planter. Female slaves, probably due to their lower physical capacity relative to their market price, spent a notably larger fraction of their lives in slavery prior to manumission. Again, the Virginia experience and that of the Chesapeake region generally differed in this from nearly every other documented slave society. In most slave societies from Roman antiquity to nineteenth-century Caribbean, women were more likely to be manumitted than men. If sex productivity-price ratios were relatively constant across time and

[25] The planter fixed effects may also mitigate any simultaneity bias between age at manumission and race, if some planters were more inclined toward sexual liaisons with slaves or were just more likely to manumit mixed-race slaves.

place in agricultural societies (that is, male female productivity ratio of 0.66 versus male-female price ratio of 0.85), the relative disinclination toward manumitting women in the Chesapeake may speak to lower rates of miscegenation in the region. In the alternative, it may speak to a social norm that militated against manumission generally, a norm powerful enough to mitigate paternal sentiments.

The only notable difference between the OLS and FE regressions is the coefficient values on the manumission regimes. Whereas the OLS results imply that manumission came later in life for slaves manumitted after 1820 and especially for those manumitted in the post-Nat Turner era, the FE results imply a very different result. For those slave owners whose manumissions spanned more than one regime, the proportion of life spent in slavery prior to manumission decreased dramatically in the post-1820 period relative to earlier eras. These estimates are consistent with historical interpretations that moving the source of waivers to the emigration requirement from the legislature to county courts represented a significant liberalization of manumission law (Jackson 1930). Planters were better able to influence to the decision to waive the emigration requirement in a local court than in the state legislature.

Complexion or Race?

Emergent literatures in economics, sociology and other social sciences document the existence of color-based preferences within the African American community itself, as well as among whites toward blacks (Hersh 2009; Goldsmith, Hamilton and Darity 2006, 2007; Rangel 2007; Ruebeck, Averett and Bodenhorn 2009). Historically, light-skinned African Americans were healthier and wealthier than blacks, and blacks exhibited color-conscious assortative mating (Bodenhorn 2003, 2006; Bodenhorn and Ruebeck 2007). A recurring question centers on whether this color consciousness was based on color per se or whether it followed from an association of light color and white ancestry.

The manumission data offers a unique opportunity to test this hypothesis because registers provided detailed descriptions of individuals, including color descriptors such as black, very black,

light, dark and others that can be collapsed into three meaningful color categories. County court clerks were careful to distinguish between blacks and mixed-race individuals with known white ancestry. Clerks' descriptions often included a line indicating the name and race of the registrant's mother; less often the registration contained the name and race of the father. Although white Virginians only rarely acknowledged paternity (or maternity, for that matter) of mixed-race offspring, it was often public knowledge. Consider the registration of Frankey McIntosh, the daughter of Molly McIntosh, in which a justice of the peace attests:

> I have known Mary aka Molly McIntosh from the time she was a Girl, that the said Molly where she was a Girl lived in the family of Argalous Price of Orange County near where I then lived, that common reports said, and … I have heard it from the family of Mr. Price in which she lived, that said Molly was the mulatto bastard child of Ann McIntosh a [illegible] servant woman while a servant in said Argalous Price, I know that the said Molly lived in the family of the said Price and I believe till she was thirty one years old [when released from servitude] (Arlington County (1801-1822), Register No. 5 (1803)).

Not every registration contained such detail on a registrant's ancestry, but it was not uncommon for clerks to record the name, complexion and status of the registrant's mother (under Virginia law, a child's status – free or slave – followed the mother's). Clearly, clerks and the white witnesses who attested to the veracity of the information provided by the registrant knew a great deal about the ancestries and backgrounds of black and mixed-race residents.

Table 4 reports OLS and FE coefficients for the restricted sample of blacks comparable to those reported previously for the full sample; namely, that features linked to productivity were associated with age at manumission. Quadratic specifications of relative height suggest that the proportion of life spent in slavery was maximized at a relative height between -0.08 (OLS) and -0.14 (FE). Both estimates lay well below the mean of 0.01. Similarly, the quintile spline specification shows that manumitted slaves were manumitted earlier if they were tall relative to their peers. As with the full sample, female slaves could expect to spend a greater proportion of their lives in slavery relative to men. The estimated effect is similar whether estimated by OLS or FE.

The notable feature of Table 4 is that dark-skinned blacks could expect to spend a considerably greater proportion of their lives in slavery than light-skinned blacks. It is difficult to construct a productivity-based explanation of the pure complexion effect, unless dark-skinned slave children were disproportionately sent to work in the fields and thereby failed to develop domestic or artisanal skilled rewarded by Virginia's slave owners.

CONCLUDING COMMENTS

After an extended scholarly quiescence, manumission in the antebellum South has recently attracted the attention of historians, sociologists and economists. This study adds to the literature by illuminating some of the factors that influenced slave owners' decisions to manumit slaves. Slaves retained some agency within the boundaries of the peculiar institution and engaged in extended negotiations concerning the nature of their bondage. Nowhere was that more evident than in their negotiating the terms of their manumissions. And the productive characteristics of slaves, including sex, race and height influenced the slave owner's calculus and partially determined the fraction of a lifetime a slave lived as a slave. In short, taller slaves, male slaves, and mixed-race and light-skinned slaves lived in slavery for shorter periods before being manumitted.

Productivity-related explanations can be offered for each of these findings. Modern studies document better labor market outcomes for taller individuals. This study finds a "peculiarly" better labor market outcome for taller slaves, namely a smaller proportion of one's life lived as a slave. The data preclude determining whether the result follows from cognitive, social or physical work capacity effects, but finding a connection between height and labor market outcomes in the 19th century is an important verification of the generality of the association uncovered for the late 20th century. Second, outside domestic or household service, female slaves were less productive in the daily grind of manual labor involved in most plantation work and were, therefore, less able to generate enough extra output to purchase their freedom at early ages. Third, mixed-race slaves were more likely to work at skilled or semi-skilled occupations on large plantations and could amass sufficient savings to

purchase their own freedom. It is hard to resist drawing the conclusion that white parents also favored their mixed-race offspring with earlier freedom. But, as Wolf (2006) noted, such an interpretation is inferred from the circumstances rather than confirmed by the evidence.

Finally, the results reported here also reveal the importance of what Budros (2004) labeled "social shocks" to manumission. Manumission law in Virginia and elsewhere was alternatively free and proscribed and prohibited and back again. Although the measure of social shocks used here are simple dummy variables designed to capture public sentiment toward liberal private manumission, the consequences of social shocks, including a post-Revolutionary embrace of it and later amendments to limit it, the law mattered but little. Fixed effects estimates suggest that, despite a public turn against manumission in the post-Nat Turner period, manumission came earlier to those slaves fortunate enough to attain their freedom in years before the Civil War. This may well have been one result of a growing free black community in the antebellum South, which would have increased the demand for manumission both for social and economic reasons. A self-sufficient free black community would have provided slaves with a more attractive outside option and, perhaps, induced them to increase their efforts to attain their freedom. In the end, this may be some of the best evidence in support of the contention that slaves retained considerable agency within the peculiar institution.

DATA APPENDIX

Registrations typically included the name of the registrant, including any known aliases, his or her age, sometimes an explicit acknowledgement of the registrant's sex (but it is inferred from first names when necessary), the registrant's height, complexion (black or mulatto), color (dark or light), any identifying scars, marks, tattoos or other distinguishing features, such as missing teeth, hair length, texture or color, and so forth. Too few of the registers reported the registrant's occupation to make use of that information. The registrant's county of birth, when different from county of registration, was consistently reported only after an 1850 amendment to the registration law required this information. An exemplar of a registration is as follows:

> 1850 September 20. No. 5314 Charlotte a free woman of colour is hereby duly registered in obedience to an order of the Hustings Court of the town of Petersburg made the 19th instant, and she is of the following description, to wit: five feet three inches high, about 64 years old, of a light complexion, has a scar on her right arm near the elbow and one on her breast, and was emancipated by

> Jethro Charles per deed dated 20th August 1850 and recorded in the Clerk's office of the said court Sept 13th 1850. Jno Mann, DC (Petersburg 1850-1858).

Charlotte's registration was typical in that in addition to a physical description of the person, it included information on the identity of the manumitting slaveholder and the legal instrument of manumission (deed or will). The likely series of events in this instance was that Jethro Charles took Charlotte with him to clerk Jonathan Mann's office sometime between August 20 and September 13, 1850 and recorded his deed of manumission dated August 20 with the clerk. The clerk completed Charlotte's freedom papers, which were filed with the Hustings Court and approved at the September 13 session. Jonathan Mann, then, transcribed the register into his official ledger on September 20 after the court had acknowledged and approved both the deed of manumission and the registration. Prior to the court's approval on September 13, Charlotte was neither legally free nor officially registered.

Charlotte's register is particularly useful for this study because it is possible to assign the date of actual manumission, as opposed to the date of the deed, to a 24-day period in 1850. Charlotte's register is relatively uncommon because of the specificity of the manumission date. A more common example of a register is Polly's, also from Petersburg:

> 1850 August 19. No. 5224. Polly a free woman of colour is hereby duly registered in obedience to an order of the Hustings Court of the town of Petersburg made the 16th instant, and she is of the following description, to wit: five feet seven inches high, about seventy two years[,] of a black complexion, has a large scar on her left arm extending from the wrist to the elbow, the little finger of the left hand crooked and was emancipated by the last will & testament of Elizabeth Gilliam, dec'd, admitted to record in the County Court of Sussex County 1 December 1796. Jno Mann, DC. (Petersburg 1850-1858).

Unlike Charlotte's, Polly's register precludes the identification of a specific date for her manumission. All that can be stated is that she was released from bondage between December 1796 (when she was 18 years old) and August 1850 (when she was 72). *In futuro* manumission was common; promises were made and deeds recorded years, sometimes even decades prior to the date of manumission.

To reduce the error-in-variable problem for the dependent variable (age at manumission), the data includes only those instances where the date of record of the deed or will and the date of registration is separated by two years or less, unless there is other credible corroborative evidence that provides a precise date of manumission. This choice represents a tradeoff between precision and sample size. Including only instances like Charlotte's with a brief window between deed and registration decreases the measurement error, but generates a smaller sample, whereas expanding the sample to include cases involving three or five-year lags between date of deed and date of registration increases the sample size only modestly and at the cost of substantially greater measurement error.

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Table 1: Summary statistics

Variable	Definition	Full sample (n=745)	Black-only sample (n=567)
Age (t*)	Age at manumission (in years)	28.65	29.82
		(16.56)	(17.29)
t*/T	Proportion of life spent in slavery	0.48	0.49
		(0.21)	(0.22)
ln[(t*/T)/(1-t*/T)]	Continuous transform of t*/T	-0.10	-0.04
		(1.02)	(1.06)
Relative height	Height (cm) / Height-by-age (cm)	0.01	0.01
		(0.06)	(0.06)
Slave Female	Manumitted slave female	0.45	0.43
Mulatto	Manumitted slave identified as "mulatto"*	0.24	--
Light	Manumitted slave identified as "light" negro**	--	0.22
Negro	Manumitted slave identified as negro**	--	0.09
Dark	Manumitted slave identified as "dark" negro**	--	0.64
Owner Female	Owner manumitting slave was female	0.21	0.22
Group	Manumitted in a group	0.73	0.75
Family	Manumitted with other family members	0.63	0.64
Deed	Manumitted by deed	0.44	0.39
Court Order	Manumitted by court order	0.03	0.03
Will	Manumitted by will	0.53	0.58
1796-1806	Liberal manumission policy	0.03	0.02
1807-1815	Manumitted slave required to emigrate from Va	0.01	0.01
1816-1819	Waiver of emigration from county courts	0.02	0.02
1820-1831	Waiver requires demonstration of merit	0.23	0.26
1831-1862	Waiver with merit, post-Nat Turner insurrection	0.71	0.68
Amherst	Manumitted in Amherst County	0.01	0.01
Arlington	Manumitted in Arlington County	0.14	0.09
Augusta	Manumitted in Augusta County	0.05	0.05
Bedford	Manumitted in Bedford County	0.02	0.02
Fairfax	Manumitted in Fairfax County	0.07	0.07
Fauquier	Manumitted in Fauquier County	0.08	0.06
Henrico	Manumitted in Henrico County	0.02	0.03
Loudon	Manumitted in Loudon County	0.04	0.05
Louisa	Manumitted in Louisa County	0.12	0.10
Lynchburg	Manumitted in Lynchburg City	0.01	0.01
Montgomery	Manumitted in Montgomery County	0.07	0.09
Norfolk	Manumitted in Norfolk City	0.01	0.01
Northampton	Manumitted in Northampton County	0.01	0.01
Petersburg	Manumitted in Petersburg City	0.12	0.11
Pittsylvania	Manumitted in Pittsylvania County	0.15	0.18
Surry	Manumitted in Surry County	0.06	0.07

Sources: see data appendix

Notes: Standard deviations in parentheses for continuous variables. * Mulatto category includes bright mulatto, light mulatto, mulatto, dark mulatto, and nearly white. ** Light negro category includes light negro, bright negro, light brown, and very bright negro. Negro includes negro, brown and copper. Dark negro includes dark, dark negro, dark brown, dark copper, black and very black. Yellow individuals were excluded from all categories because the term was applied to both blacks and mulattoes, often without qualification.

Table 2: Determinants of proportion of life in slavery – OLS regressions, full sample

	(1)	(2)	(3)	(4)
Relative height	-5.09***	-3.64***	-4.03***	---
	[0.000]	[0.007]	[0.002]	
Relative height squared	---	-25.19***	-26.51***	---
		[0.000]	[0.000]	
Relative height quintile 1	---	---	---	1.42
				[0.585]
Relative height quintile 2	---	---	---	-1.95
				[0.660]
Relative height quintile 3	---	---	---	1.06
				[0.838]
Relative height quintile 4	---	---	---	-11.09***
				[0.004]
Relative height quintile 5	---	---	---	-10.18***
				[0.000]
Mixed race	-0.30***	-0.32***	-0.28**	-0.27**
	[0.004]	[0.002]	[0.012]	[0.011]
Slave female	0.13*	0.13	0.16**	0.15*
	[0.090]	[0.112]	[0.048]	[0.068]
Manumission by deed	0.10	0.12	0.18	0.19*
	[0.284]	[0.182]	[0.112]	[0.097]
Manumission by court order	-0.59**	-0.60**	-0.57*	-0.58*
	[0.034]	[0.028]	[0.062]	[0.059]
Slave owner female	-0.52***	-0.49***	-0.57***	-0.57***
	[0.000]	[0.000]	[0.000]	[0.000]
Slaveholder female*slave adult male	0.80***	0.75***	0.76***	0.75***
	[0.000]	[0.000]	[0.000]	[0.000]
Group manumission	-0.27**	-0.26**	-0.36***	-0.36***
	[0.021]	[0.020]	[0.001]	[0.001]
Family manumission	-0.34***	-0.31**	-0.25**	-0.24**
	[0.008]	[0.014]	[0.033]	[0.038]
Manumitted 1807-1815	0.27	0.24	0.18	0.15
	[0.188]	[0.238]	[0.486]	[0.564]
Manumitted 1816-1819	-0.51**	-0.48**	-0.66***	-0.65
	[0.014]	[0.014]	[0.003]	[0.005]
Manumitted 1820-1831	0.21	0.21	0.25	0.25
	[0.191]	[0.184]	[0.337]	[0.361]
Manumitted 1832-1865	0.25**	0.25**	0.52**	0.52**
	[0.048]	[0.043]	[0.017]	[0.021]
Constant	0.19	0.24	-0.09	0.03
	[0.244]	[0.143]	[0.741]	[0.913]
County/city controls	No	No	Yes	Yes
R-square	0.27	0.29	0.33	0.34

Sources: see data appendix. Notes: dependent variable – ln[(t*/T) / (1-(t*/T))]. P-values in parentheses. N=745 in all regressions. All regressions estimated with robust standard errors clustered on manumission groups.

Table 3: Determinants of proportion of life in slavery – Fixed effects regressions – full sample

	(1)	(2)	(3)
Relative height	-7.59***	-6.25***	---
	[0.000]	[0.000]	
Relative height squared	---	-20.59***	---
		[0.000]	
Relative height quintile 1	---	---	0.30
			[0.904]
Relative height quintile 2	---	---	-3.72
			[0.556]
Relative height quintile 3	---	---	-4.33
			[0.565]
Relative height quintile 4	---	---	-15.21***
			[0.002]
Relative height quintile 5	---	---	-9.37***
			[0.000]
Mixed race	-0.42***	-0.44***	-0.40***
	[0.001]	[0.001]	[0.002]
Slave female	0.26***	0.24***	0.21**
	[0.003]	[0.005]	[0.013]
Manumission by deed	0.50	0.50	0.44
	[0.446]	[0.436]	[0.495]
Manumission by court order	0.18	0.15	0.062
	[0.160]	[0.890]	[0.954]
Slave owner female	0.60	-0.50	-0.48
	[0.149]	[0.225]	[0.244]
Slaveholder female*slave adult male	0.95***	0.89***	0.86***
	[0.000]	[0.000]	[0.000]
Manumit family	-0.57*	-0.48	-0.44
	[0.070]	[0.123]	[0.157]
Manumitted 1820-1831	-2.52**	-2.53**	-2.48**
	[0.014]	[0.012]	[0.014]
Manumitted 1832-1865	-2.81***	-2.81***	-2.73***
	[0.009]	[0.008]	[0.009]
Constant	2.96***	2.96***	3.13***
	[0.005]	[0.005]	[0.003]

Sources: see Table 2.
Notes: Relative height in column (3) expressed as quintile splines. P-values in parentheses. N=745 in all regressions.

Table 4: Determinants of proportion of life in slavery – OLS and fixed effects regressions, blacks-only sample

	(1) OLS	(2) OLS	(3) Fixed effects	(4) Fixed effects
Relative height	-4.32***	---	-6.03***	---
	[0.002]		[0.000]	
Relative height squared	-27.35***	---	-20.83***	---
	[0.000]		[0.000]	
Relative height quintile 1	---	1.72	---	0.70
		[0.484]		[0.781]
Relative height quintile 2	---	0.49	---	-5.70
		[0.922]		[0.414]
Relative height quintile 3	---	0.14	---	-0.64
		[0.979]		[0.938]
Relative height quintile 4	---	-14.71***	---	-16.29***
		[0.006]		[0.003]
Relative height quintile 5	---	-10.04***	---	-9.44***
		[0.000]		[0.000]
Dark black	0.29**	0.29**	0.35**	0.33**
	[0.011]	[0.011]	[0.031]	[0.038]
Light black	-0.18	-0.17	-0.29	-0.30
	[0.293]	[0.311]	[0.124]	[0.119]
Slave female	0.26***	0.25***	0.32***	0.29***
	[0.003]	[0.006]	[0.001]	[0.003]
Manumission by deed	0.10	0.10	0.47	0.50
	[0.389]	[0.337]	[0.697]	[0.678]
Manumission by court order	-0.62	-0.63	---	---
	[0.116]	[0.117]		
Slave owner female	-0.57***	-0.57***	---	---
	[0.000]	[0.000]		
Slaveholder female*slave adult male	0.81***	0.80***	0.91***	0.86***
	[0.000}	[0.000]	[0.000]	[0.001]
Group manumission	-0.41***	-0.43***	---	---
	[0.002]	[0.001]		
Family manumission	-0.32**	-0.30**	-0.44	-0.38
	[0.020]	[0.025]	[0.337]	[0.410]
Manumitted 1807-1815	0.28	0.23	---	---
	[0.399]	[0.477]		
Manumitted 1816-1819	-0.42	-0.37	---	---
	[0.109]	[0.146]		
Manumitted 1820-1831	0.22	0.22	---	---
	[0.505]	[0.495]		
Manumitted 1832-1865	0.59*	0.59*	---	---
	[0.059]	[0.055]		
Constant	-0.31	0.19	0.07	0.28
	[0.391]	[0.604]	[0.905]	[0.638]
County/city controls	Yes	Yes	No	No
R-square	0.38	0.39	--	--

Sources: see data appendix. Notes: dependent variable – ln[(t*/T) / (1-(t*/T))]. P-values in parentheses. N=566 in all regressions. All regressions estimated with robust standard errors clustered on manumission groups.