Buying Votes in the Lab: Introducing Prospect Theory in the Study of Clientelism

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Abstract

Except for a number of qualitative research, most quantitative papers consider vote buying as a binary variable; it happens or not. How much is a party willing to spend on a vote? This question is rather important since it speaks about the domains of risk in which a candidate makes that decision. From an analytical point of view, we introduce prospect theory to the study of clientelism as a valid framework to study decision making under risk. After formalizing a theory of vote buying and vote selling within the expected utility theory, we tested these claims in the lab by designing an economic experiment. The experiment was carefully designed to capture different domains of gains and losses. Exploiting these novel experimental data, we show that there exists wide support for prospect theory. As the analyses suggest, experimental subjects engage in more risky and expensive vote-buying as the domain shifts from one of gains to one of losses.

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Keywords — vote-buying; clientelism; experimental methods; formal theory; prospect theory

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I. Introduction

Scholars mostly agree on the positive correlation between poverty and clientelism (Calvo and Murillo 2004; Weitz-Shapiro 2012; Kitschelt 2000; Kitschelt and Altamirano 2015).[1] Since the poor derive more utility from immediate transfers than the uncertain returns associated with future policy packages, clientelist political parties only target the poor (Brusco, Nazareno, and Stokes (2004) and Stokes et al. (2013)). Indeed, Weitz-Shapiro (2014, p. 12) explained that "[a]lmost universally, scholars of clientelism treat and analyze [this] practice as an exchange between politicians and their poor clients."

This agreement has recently been challenged (Hicken 2007, p. 55). González-Ocantos et al. (2012) and Holland and Palmer-Rubin (2015) found that income had little or no effect on vote-buying. For instance, Szwarcberg (2013, p. 32) "challenges the assumption [that brokers] with access to material benefits will always distribute goods to low-income voters in exchange for electoral support." In fact, Bahamonde (2018) explains that non-poor individuals can be targeted when they are sufficiently noticeable, increasing compliance. He explains that wealthy houses in very poor neighborhoods in Brazil can be targeted too.

While there are important agreements, the literature has failed to provide a convincing answer to the following question: *Who do parties target? Swing or core voters? Why?* These questions have historically haunted the literature. In fact, Carlin and Moseley (2015, p. 14) states that "our knowledge of who parties target remains incomplete." On the one hand, Cox and Mccubbins (1986) explain that since constituencies are well-known, they allocate resources to core voters. On the other hand, Stokes (2005) argues that since allocating resources to individuals who *ex-ante*vote for the party is a waste, parties target swing voters (similarly, see Zarazaga (2016) and Gallego (2014)). Yet, Zarazaga (2016, p7) asserts that both "[q]ualitative and quantitative evidence mainly shows that party machines reward their own supporters," not swing voters.

Instead, the clientelism literature has seen a proliferation of tangential answers. While all of them are contributions, they do not really tackle the afore mentioned question. Dixit and Londregan (1996) explain that parties both swing and core voters, but that depends on a number of factors. . add something
Nichter (2008) (turnout-buying) is another very important contribution. Unfortunately, it deviates from the question by increasing the complexity on the varieties of clientelism. Similarly, Zarazaga

[1] Following Nichter (2014, p. 316), clientelist vote-buying is defined as "the distribution of rewards to individuals or small groups during elections in contingent exchange for vote choices."

(2016, p. 7) introduces yet another category (conditional supporters) who "will vote for the party machine only as long as unexpected events do not persuade them to do otherwise"

The paper seeks to contribute to this issue by incorporating both structural and individual factors that foster clientelism in the same theory.

II. The Model

We consider an electorate of n voters. Voters vote for a leader to implement a common policy γ from the set $\Gamma = \{1, 2, ..., 100\}$. Each citizen i has an ideal point x_i which is an *iid* draw from an uniform distribution Γ. When policy γ is implemented, payoffs of citizen i are given by $u(D, x_i, \gamma) = D - |x_i - \gamma|$, where D represents completar acá. This payoff can be incremented by transferences from both parties to voter i.

In this election, there are two candidates. One "left-wing" party and one "right-wing" party. The left-wing (right-wing) candidate represents a policy γ_L (γ_R) which is an *iid* draw from an uniform distribution over $\{1, ..., 50\}$ ($\{51, ..., 100\}$). The location of this policy give us the number of voters n_L leaning towards the left-wing candidate, while the number of voters leaning towards the right-wing party is given by $n_L + n_R = n$. While we consider that voters are attached to an ideological continuum, we do so with the sole purpose of modeling preferences—both formally and experimentally.[2]

Moving forward, both parties negotiate with only one of these n voters. That voter is randomly selected from the total population n. Observe that the higher the n, the lower the representation in the election of this voter. That is, a larger n necessarily implies that every individual electoral choice matters less. However, if n is small, negotiating with this voter may be more attractive to political parties. This is because negotiating with a large number of voters is costly. We assume that each party has a budget (B) that they can use to buy votes. If a party decides not to negotiate with the voter (or the voter does no accept the offer), the party keeps this budget. The profits of party i is given by,

[2]Ultimately, experimental subjects are not told anything about ideology. They only observe that there are a number of "points" associated with the victory of party A or party B. In this sense, voters lean ("ideologically") towards the party that gives them more points.

$$\pi_i(W, e_i, s_i) = W \cdot e_i + (1 - s_i \cdot a_j) \cdot B$$

where W ($W \geq B$) is a constant that represents how much each party values winning the election, $e_i = 1$ if party i wins the election, 0 otherwise, s_i is the fraction of B that the party offers to voter j who can accept the offer ($a_j = 1$) or not ($a_j = 0$). We study two versions of this party-voter interaction. One is where both parties make simultaneous offers to the voter, and she decides whether to accept the offer (vote-buying case). Another one is where the voter can make private offers to both parties, and then the party decides if to pay or not for that voter's vote (vote-selling case).

The timing of the game is as follows: at the beginning of the game n voters and two political parties are randomly located on their respective ideal points: voters along Γ, the "left-wing" candidate along $\{1, ..., 50\}$, and the "right-wing" candidate on $\{51, ..., 100\}$. All locations are public information, as well as every party's budget B, the total number of voters (n) and the number of supporters of each party (n_L and n_R). What follows then, depends on the specific game. On the vote-buying case, each party simultaneously decides if making an offer to the voter. If a party decides to negotiate with the voter, privately offers him to buy his vote (i.e. accept the offer and vote for the party). Then the voter decides if to take the offer, or which one accept if he receives two offers. If he accepts an offer, he should vote for that candidate.[3] On the vote-selling case, the voter may privately propose a certain amount to each party in exchange for her vote. Then the parties decide if to pay or not the offer. The voter then decides which one to accept, if any. In this case, the voter offers to one or both parties, and each proposed amount might be different.

I. Equilibrium in Vote-Buying Case

In this case, both parties can offer certain amount in exchange for electoral support. Note that parties only have incentives to negotiate with a voter if he is the pivotal voter. That means that $|n_L - n_R| \leq 1$, and that voter i supports the ex-ante winner of the election ($i \in max\{n_L, n_R\}$). The voter prefers the party closer to her ideal point. If both parties are located at the same distance, the

[3]It is important to consider that to simplify the game (and the experiment), accepting the offer necessarily implies compliance. That is, accepting the offer means voting for the party the voter accepted the offer from. We leave for future research the case where the voter may defect.

voter is indifferent. Denote by $i^* \in \{L, R\}$ the preferred party of the voter, and $-i^*$ the other party.

Note that, naturally, both parties want to make different offers. If the voter is pivotal, the less preferred party has incentives to offer him a certain amount m_{-i^*} such that the he perceives more utility voting for that party rather than voting for the opposite party, that is:

$$
\begin{aligned}
m_{-i^*} &\geq (D - |x_{i^*} - \gamma_{i^*}|) - (D - |x_{i^*} - \gamma_{-i^*}|) \\
&= |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|.
\end{aligned}
$$

Parties expect winning the election but have limited budgets. Hence, they want to win the election at a minimum cost. If party $-i^*$ offers the voter $m_{-i^*} = |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|$, he will be indifferent between voting for party i^* or party $-i^*$. Both offers $m_{i^*} = 0$ and $m_{-i^*} = |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|$ are the minimum amount, but enough to make the pivotal voter indifferent between both political parties. Indifference gives the party some electoral advantage of winning of the election. Voter indifference gives two possible Nash equilibria. In one equilibrium the voter rejects the offer and votes for i^*. In the other equilibrium, the voter accepts the offer and the elected party is $-i^*$. If individuals are utility maximizers, they should be indifferent between these two equilibria.

II. Equilibrium in Vote-Selling Case

In the case that the voter can set the a price of his vote, he may negotiate with one or both parties setting the price that he is willing to accept in exchanging of voting for that party. In this setting, the voter has incentives to set the highest price each party can pay. In our model this is given by B (which is public knowledge). When the voter is pivotal, he may swing towards party $-i^*$ only if the budget is big enough to compensate what he looses when voting for his less prefer policy ($B > |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|$). When the voter decides to negotiate with both parties, and both accept to pay the price set by him, he chooses one offer, voting for his preferred political party i^*.

Since the parties-voter negotiation does not change the electoral outcome, vote-selling is not efficient to parties. When a party wins the election due to vote-selling, the party's payoff is $\pi_i(W, 1, 1) = W$, while the loser party obtains $\pi_i(W, 0, 0) = B$. If the pivotal voter decides to negotiate with both political forces, parties i^* and $-i^*$ have to decide if accept to pay B to the voter. This strategic situation is represented as follows,[4]

		$-i^*$ Accept	$-i^*$ Reject
i^*	Accept	W , B	W , B
i^*	Reject	B , W	$W + B$, B

Thus, we can observe that there exists an unique equilibrium where both parties are willing to pay B to the voter.

III. Experimental Design

Following our theoretical formalizations, a lab economic experiment was performed. The experiment was conducted at O'Higgins University and Centre for Experimental Social Sciences (CESS) of *Universidad de Santiago*, Chile. Subjects received a minimum of $5,000 Chilean pesos. The maximum depended on the quality of individual decisions. summary statistics here. The basic flow is depicted in Figure 1.

The experiment has two parts, with four stages each. The first part is the vote-buying portion. During the first stage, participants are assigned a role at random. They can be either *party A*, *party B*, or *voter*. Voters are assigned at random an "ideological" position. That is, voters receive a certain amount of points (at random) depending on whether party A or B wins the election. For instance, if party A wins election, a voter might receive 2,400 points, whereas if party B wins the election, the voter might receive 200 points. It is in this sense that the voter is "ideologically" closer to party A. The substantive correlate is that voters perceive some utility when, for instance, their preferred fiscal policies are implemented. During the first stage, both parties receive different endowments too. The idea is to reflect the fact that some parties are wealthier than others. Note that voters receive zero endowments. The clientelism literature is consistent in that both poor and rich voters are prone to receive clientelist offerings (Bahamonde 2018).

[4] This situation is considering that, if both parties accept to pay the price set by the voter, he prefers the party i^*.

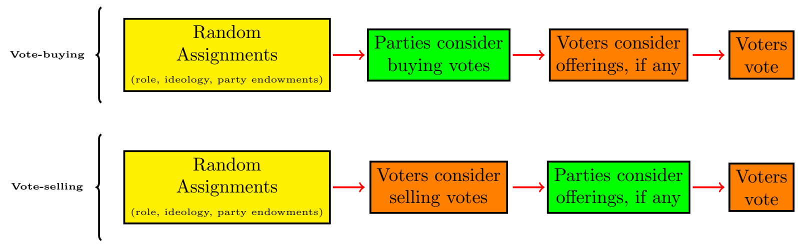

Figure 1: Experimental Flow.
Note: *Note here.*

During the second stage of the first part, parties decide whether to go out and buy votes by making clientelist offerings. Experimental subjects playing the party role enter an amount of points, which ranges from zero to the maximum assigned budget. They are told that offering zero means they do not want to buy votes. Importantly, both budgets (for party A and B) are the same. However, given that the voter-party distance is assigned at random, both parties have *relative* "different" budgets.

In the third stage voters evaluate whether to take that offer or not. If the party decided that it did not want to make an offer at that time, the voter is told that the party did not make an offer. Voters are told that accepting the offer necessarily implies voting for that party (no defecting in this experimental design). In this regard, the third and fourth stage are in reality one stage.

The second part is the vote-selling portion of the experiment. This part is run during the same experimental session, but loading a separate `Ztree` program. Right after the first part is completed, experimental subjects are then asked to continue with the study.

The second part is exactly the same, except that this time voters are first-players: they get to offer parties an amount of points, and then, parties get to decide whether to take or reject that offer. Note that the experimental currency are "points," which later translated into actual money.[5]

I. Expected Comparative Statics

This experiment randomizes the voter's and party's "ideological" positions, party endowments,[6], and whether the voter is pivotal or not (whether the voters represents $\frac{1}{3}$ or $\frac{1}{5}$ of the electorate). There is one static event, namely, the order of the experiment (the vote-buying part goes first, while the

[5]Particularly, Chilean pesos.
[6]As explained above, not directly, but by randomizing the ideological position of voters. By doing so, we are able to manipulate the *relative* purchasing power of every party.

vote-selling part goes second). This aspect is presented to all experimental subjects (both roles) before the second stage (both experimental parts). Exploiting this experimental data, we intend to shed light on the conditions that foster vote-buying/selling. Particularly, we are interested in analyzing the next aspects of a clientelist transaction.

Ideology. Since Downs (1957), spatial theorist have theorized for a long time about the role of political ideology on different electoral aspects (see Enelow and Hinich (1990) for a review). Unfortunately, one of the main criticisms of the Downsian paradigm, is its unidimensionality. That is, the big assumption of voters being concerned only about the spatial distance between their policy preferences and the ones of the available parties. Acknowledging this problem, Adams, III, and Grofman (2005, p. 20) introduce "non-policy" factors. Unfortunately, these factors are mainly socio-demographics traits, such as race, gender, income, among others. While it is true that these traits are not strictly policy-based, they are highly correlated with them. In this paper we try to advance the literature by incorporating clientelism, a non-policy issue (Kitschelt and Wilkinson 2006).

Our experimental design allows us to explore the tipping point at which voters stop caring about ideology. Since the voter-party spatial distance is randomized, our design sheds some light on the elasticity of ideology, clarifying *when* voters renounce to politics (and start selling their votes). Hence, by offering voters a non-policy choice (selling one's vote), we complement the spatial literature, ultimately, by focusing on the question of democratic values too.

Competitiveness. The degree in which elections are contested or not has an important role in explaining clientelism. Competitive authoritarian regimes (Levitsky and Way 2010) survive not due to electoral fraud, but because of the incumbent's capacity to mobilize a large mass of supporters, discouraging likely opposers (Magaloni 2008). Unfortunately, we still do not know at which point likely opposers feel discouraged, and abandon the electoral race. Since the experiment also randomizes the number of likely voters, we will be able to observe at which point is efficient to buy votes (when needed), and at which point is a waste.

Endowments. For the Brazilian case, Bahamonde (2018) explains that parties with access to more resources are also able to buy more expensive goods, even targeting the wealthy. However, Szwarcberg (2013, p. 32) finds that parties with access to material resources does not necessarily imply clientelist targeting. The literature then has not been really able to explain the relationship between having resources and vote-buying: *Do parties with more resources engage in vote-buying?*

Targeting. *Who do political parties target? Swing voters or core supporters?*

Voter's Bargaining Power. By manipulating the relative importance of a voter, we will be able to answer the following question: *Does block voting (i.e. when unions or other civic groups vote coordinately for the same candidate) increase the selling price?*

Sequence. By considering two sequences, one where the party gets to be the first player, and one where the voter does, *Does the order matter?*

IV. Statistical Analyses

Test

	OLS	Logit
	Amount of Vote-Buying Offer	Competitive Vote-Buying Offer
(Intercept)	678.24	−0.32
	(1.38)	(1.01)
vote.intention.party	152.03$^{\cdot}$	
	(1.90)	
points.cumul.delta	−0.10**	−0.00
	(−3.04)	(0.00)
ideo.distance	−0.20	−0.00
	(−0.07)	(0.01)
budget	0.03	−0.00
	(0.07)	(0.00)
R^2	0.71	
Adj. R^2	−0.05	
Num. obs.	136	136
AIC		186.58
BIC		198.23
Log Likelihood		−89.29
Deviance		178.58

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{cdot}p < 0.1$. Robust standard errors in parentheses. OLS model with fixed effects (parameteres omitted).

Table 2: *Statistical models*

	role	variable	n	min	max	median	iqr	mean	sd	se	ci
1	Partido A	left.right	66.00	1.00	10.00	3.00	4.00	3.92	2.39	0.29	0.59
2	Partido B	left.right	66.00	1.00	10.00	3.50	3.00	4.09	2.40	0.29	0.59
3	votantes	left.right	68.00	1.00	10.00	3.00	3.00	3.73	2.21	0.27	0.54
4	Partido A	male	66.00	0.00	1.00	0.00	1.00	0.33	0.47	0.06	0.12
5	Partido B	male	66.00	0.00	1.00	0.00	1.00	0.32	0.47	0.06	0.12
6	votantes	male	68.00	0.00	1.00	0.00	1.00	0.31	0.47	0.06	0.11
7	Partido A	party.id	66.00	2.00	9.00	9.00	0.00	8.14	1.71	0.21	0.42
8	Partido B	party.id	66.00	1.00	9.00	9.00	0.00	8.53	1.33	0.16	0.33
9	votantes	party.id	68.00	1.00	9.00	9.00	0.00	8.18	1.83	0.22	0.44
10	Partido A	party.like	66.00	0.00	1.00	0.00	0.75	0.26	0.44	0.05	0.11
11	Partido B	party.like	66.00	0.00	1.00	0.00	0.00	0.17	0.38	0.05	0.09
12	votantes	party.like	68.00	0.00	1.00	0.00	0.00	0.22	0.42	0.05	0.10
13	Partido A	payoff	73.00	633.00	4224.00	2630.00	674.00	2621.44	670.37	78.46	156.4
14	Partido B	payoff	72.00	1148.00	4062.00	2592.00	710.50	2607.29	664.54	78.32	156.1
15	votantes	payoff	75.00	633.00	4224.00	2674.00	836.50	2663.83	696.62	80.44	160.2
16	Partido A	salary.enough	66.00	1.00	4.00	2.00	0.00	2.06	0.68	0.08	0.17
17	Partido B	salary.enough	66.00	1.00	4.00	2.00	0.75	2.12	0.67	0.08	0.16
18	votantes	salary.enough	68.00	1.00	3.00	2.00	0.00	1.99	0.61	0.07	0.15
19	Partido A	vote.last.election	66.00	0.00	1.00	1.00	0.00	0.83	0.38	0.05	0.09
20	Partido B	vote.last.election	66.00	0.00	1.00	1.00	0.00	0.86	0.35	0.04	0.09
21	votantes	vote.last.election	68.00	0.00	1.00	1.00	0.00	0.90	0.31	0.04	0.07
22	Partido A	vote.next.election	66.00	0.00	1.00	1.00	0.00	0.95	0.21	0.03	0.05
23	Partido B	vote.next.election	66.00	0.00	1.00	1.00	0.00	0.98	0.12	0.01	0.03
24	votantes	vote.next.election	68.00	0.00	1.00	1.00	0.00	0.94	0.24	0.03	0.06

Table 1: *Summary Statistics*

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## Error: Confidence intervals could not be computed.
## Error: Confidence intervals could not be computed.
## Error: Confidence intervals could not be computed.
## Error: Confidence intervals could not be computed.
```

```
# data.model.1 = data.frame(read.csv(url("https://raw.githubusercontent.com/hbahamonde/Economic_Expe

data.model.1 = read.csv("/Users/hectorbahamonde/research/Economic_Experiment_Vote_Selling/data_model



library(lattice)
```

```
## Warning in paste0("package:", package):  NAs introduced by coercion to integer range

library(latticeExtra)

## Warning in paste0("package:", package):  NAs introduced by coercion to integer range

library(DAMisc)

## Warning in paste0("package:", package):  NAs introduced by coercion to integer range

xyplot(predicted ~ x | group,
       scales=list(relation="free", rot=0),
       data=data.model.1,
       aspect = 1,
       xlab = "x",
       ylab = "y",
       lower=data.model.1$conf.low,
       upper=data.model.1$conf.high,
       panel = panel.ci,
       zl=F,
       prepanel=prepanel.ci)

## Warning in deparse(x):  NAs introduced by coercion to integer range
## Warning in paste(deparse(x), collapse = ""):  NAs introduced by coercion to integer
range
## Warning in factor(z, levels = seq_len(nlevels(x)), labels = levels(x), ordered =
is.ordered(x)):  NAs introduced by coercion to integer range
## Warning in match(x, levels):  NAs introduced by coercion to integer range
## Warning in deparse(x):  NAs introduced by coercion to integer range
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range
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## Warning in trellis.skeleton(formula = base::quote(predicted ~ x | group), :  NAs
introduced by coercion to integer range
## Warning in min(x, na.rm = na.rm):  no non-missing arguments to min; returning Inf
## Warning in max(x, na.rm = na.rm):  no non-missing arguments to max; returning -Inf
## Warning in min(x, na.rm = na.rm):  no non-missing arguments to min; returning Inf
## Warning in max(x, na.rm = na.rm):  no non-missing arguments to max; returning -Inf
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coercion to integer range
## Warning in paste(prefix, suffix, index, sep = "."):  NAs introduced by coercion
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introduced by coercion to integer range
## Warning in paste(logpaste, format(at, trim = TRUE), sep = ""):  NAs introduced by
coercion to integer range
## Warning in paste(prefix, suffix, index, sep = "."):  NAs introduced by coercion
to integer range
## Warning in paste(prefix, suffix, index, sep = "."):  NAs introduced by coercion
to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste(logpaste, format(at, trim = TRUE), sep = ""):  NAs introduced by
coercion to integer range
## Warning in paste(prefix, suffix, index, sep = "."):  NAs introduced by coercion
to integer range
## Warning in paste(prefix, suffix, index, sep = "."):  NAs introduced by coercion
to integer range
## Warning in paste(x[c("major", "minor")], collapse = "."):  NAs introduced by coercion
to integer range
## Warning in paste(prefix, switch(type, panel = paste(name, type, column, :  NAs introduced
by coercion to integer range
```

```
## Warning in paste(prefix, switch(name, position = "position.vp", split = "split.vp",
:  NAs introduced by coercion to integer range
## Warning in paste(prefix, switch(name, position = "position.vp", split = "split.vp",
:  NAs introduced by coercion to integer range
## Warning in paste(names[seq_len(n - 1L)], collapse = .grid.pathSep):  NAs introduced
by coercion to integer range
## Warning in paste(x$path, x$name, sep = .grid.pathSep):  NAs introduced by coercion
to integer range
## Warning in paste(prefix, switch(name, position = "position.vp", split = "split.vp",
:  NAs introduced by coercion to integer range
## Warning in paste(names[seq_len(n - 1L)], collapse = .grid.pathSep):  NAs introduced
by coercion to integer range
## Warning in paste(x$path, x$name, sep = .grid.pathSep):  NAs introduced by coercion
to integer range
## Warning in paste(prefix, switch(name, position = "position.vp", split = "split.vp",
:  NAs introduced by coercion to integer range
## Warning in paste(names[seq_len(n - 1L)], collapse = .grid.pathSep):  NAs introduced
by coercion to integer range
## Warning in paste(x$path, x$name, sep = .grid.pathSep):  NAs introduced by coercion
to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste0(nmc[i], "=", if (is.numeric(x)) format(x) else x):  NAs introduced
by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
```

```
## Warning in paste0(nmc[i], "=", if (is.numeric(x)) format(x) else x):  NAs introduced
by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste0(nmc[i], "=", if (is.numeric(x)) format(x) else x):  NAs introduced
by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in paste0("Var", iArgs):  NAs introduced by coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste0(nmc[i], "=", if (is.numeric(x)) format(x) else x):  NAs introduced
by coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste(logpaste, format(at, trim = TRUE), sep = ""):  NAs introduced by
coercion to integer range
## Warning in prettyNum(.Internal(format(x, trim, digits, nsmall, width, 3L, :  NAs
introduced by coercion to integer range
## Warning in paste(logpaste, format(at, trim = TRUE), sep = ""):  NAs introduced by
coercion to integer range
## Warning in .makeMessage(..., domain = domain):  NAs introduced by coercion to integer
range
## Warning in paste(args, collapse = ""):  NAs introduced by coercion to integer range
## Error in valid.viewport(x, y, width, height, just, gp, clip, mask, xscale, :  invalid
'yscale' in viewport
```

y

x

Test

V. Discussion

Discussion pending.

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