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Carin van der Cruijsen and Frank van der Horst

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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

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De Nederlandsche Bank NV
P.O. Box 98
1000 AB AMSTERDAM
The Netherlands

Payment behaviour: the role of socio-psychological factors *

Carin van der Cruijsen[a] and Frank van der Horst[a]

[a] *De Nederlandsche Bank, the Netherlands*

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Abstract

This research examines the effects of socio-psychological factors on consumers' payment behaviour. Based on insights from the socio-psychological and payment literature we build a theoretical model of payment behaviour. We test this model empirically by focussing on the choice between cash and electronic payments, and by using the outcomes of two specially constructed surveys of a representative panel of Dutch consumers. We are significantly better able to explain payment behaviour than traditional payment models. Moreover, we provide useful insights for those who want to understand and steer payment behaviour. Consumers' payment attitudes depend on perceptions of attributes, such as safety and acceptance. Together with social norms, roles, emotions, and perceived control, these attitudes drive payment intentions. Although payment intentions are the key determinant of payment behaviour, payment habits also play an important role in explaining how consumers pay.

Keywords: payment behaviour, attitude, intention, socio-psychological model, consumer survey, habit, social norms, personal norm, roles, control, emotions.
JEL classifications: D14, D11, D03, Z13.

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1. Introduction

People don't always act in line with their intentions. There is ample research showing that this is a widespread phenomenon. For example, a meta-analysis by Webb and Sheeran (2006) reveals that a medium-to-large change in intention only results in a small-to-medium change in behaviour. Their sample includes research on a wide range of topics, from papers on exercising and smoking to studies on cycle helmet use and study behaviour.

Within the field of payments, research on this topic is still in its infancy. This is surprising given that paying is a form of behaviour that is commonplace and that various organizations are monitoring and steering payment behaviour. Although there is some evidence of a gap between consumers' payment preferences and actual payment behaviour (Van der Cruijsen et al. 2016) detailed research on the socio-psychological drivers of payment behaviour is absent. It can be assumed that, like all behaviour, payment behaviour is not solely a deliberative process. With respect to their feeling, thinking and acting people are influenced by their social surroundings and psychological factors. Payment researchers either neglect these socio-psychological factors or focus on one specific factor. For example, Van der Horst and Matthijsen (2013) and Kahn et al. (2015) point to the importance of emotions. Most studies on payment behaviour find that the adoption and usage of payment instruments depend on transaction-related and personal characteristics, as well as perceptions of payment instrument attributes. However, socio-psychological factors are not considered (see Kosse 2014 for a literature review). The explanatory power of the current models that try to explain this behaviour is limited. A key goal of our research is to improve our understanding of payment behaviour. An increasing number of economists support broadening the economic discourse by using insights from other research disciplines (e.g. Hoff and Stiglitz 2016). This would create more realistic economic models that are better able to explain actual behaviour.

We follow this advice and build and estimate a socio-psychological model of payment behaviour to fill this gap in payment literature and improve knowledge on the drivers of payment behaviour. This enables us to address the research question: *To what extent do socio-psychological factors drive payment behaviour?* Our model uses insights from commonly used socio-psychological models that explain attitudes, intentions and actual behaviour. In addition to these factors, our model includes perceptions of payment instrument attributes and control variables. Firstly, we assess to what extent perceived payment instrument attributes drive consumers' attitudes towards payment instruments. Secondly, we analyse the role of a wide range of socio-psychological factors in forming payment intentions. Lastly, we examine the strength of the relationship between payment intention and actual payment behaviour and the degree to which actual control and habits affect how consumers pay. We have collected data in two steps. Our first consumer survey measures payment intention and socio-psychological factors, whereas our

second questionnaire includes questions on actual payment behaviour and whether panellists could pay how they wanted to pay.

Our findings on the drivers of payment attitude, intention and actual payment behaviour will help stakeholders, such as banks and merchants, that perform the challenging task of steering payment behaviour towards safe and cost-efficient means of payment. One of the goals of our research is to add a tool to their toolkit: knowledge on the importance of socio-psychological factors. Shifts in payment behaviour may result in a major money-saver for society (e.g. Jonker 2013 or Segendorf and Jansson 2012). Efficient, reliable and safe retail payment systems are a key element of well-functioning economies. Hasan et al. (2012a) show that increased use of efficient electronic payment instruments fuels economic growth, consumption and trade, and Hasan et al. 2012b report that it also stimulates banking business (Hasan et al. 2012b).

The Netherlands offers a good setting to research the intensity of use of payment instruments. There are two key payment instruments, the debit card and cash, which are adopted by almost all consumers. We test our model empirically by focussing on the choice between cash and electronic payments. Furthermore, banks and merchants agreed to stimulate debit card usage in a covenant (Foundation for the Promotion of Efficient Payments 2009), and as a result there were various media campaigns to stimulate use of electronic payment methods (Jonker et al. 2015). The acceptance of the debit card increased substantially (Panteia 2015) and few merchants still surcharge debit card payments below a certain amount. The effects of these policies on socio-psychological factors, such as perceived control and social norms, are likely to depend on the type of consumer. Therefore, we expect to find enough variation in these variables to estimate our model and draw useful conclusions on the extent to which socio-psychological factors drive payment behaviour.

Our main result is that socio-psychological factors explain payment attitude, intention and behaviour well; our model outperforms commonly used ways to explain consumers' payment behaviour. Firstly, we document that consumers' payment attitudes depend on perceived attributes, especially perceived safety and acceptance. Secondly, we show that attitude drives payment intentions, together with social norms, roles, emotions, and perceived control. Emotions are particularly important in this respect. Lastly, we reveal that although payment intentions are the key driver of payment behaviour, payment habits also play an important role in explaining how consumers pay. The role of actual control over the payment situation, like having enough money in the wallet when you want to pay cash or not experiencing technical disturbances when you want to pay electronically, is limited.

Section 2 presents our socio-psychological model of payment behaviour. Section 3 describes the data that we have collected to test whether this model explains consumers' attitudes, intentions and actual behaviour well. Section 4 outlines how the elements of our model

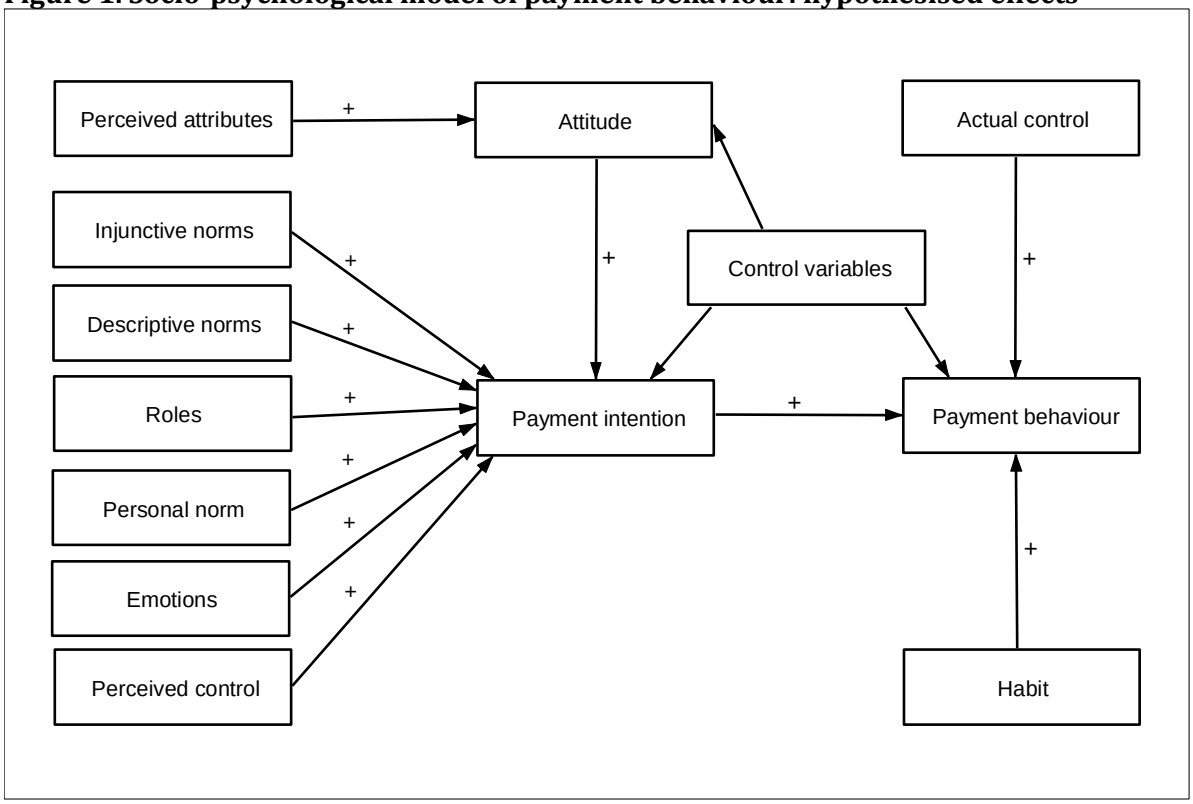
are measured and describes the outcomes of these variables. Section 5 tests our theoretical model. The robustness of our results is discussed in Section 6. We end with a discussion of the policy implications of our research, conclusions and some avenues for future research in Section 7.

2. A socio-psychological model of payment behaviour

A conceptual model of payment behaviour

We construct a conceptual socio-psychological model with payment attitude, intention and actual behaviour and their drivers. Figure 1 shows our model, including the hypothesised effects.

Figure 1. Socio-psychological model of payment behaviour: hypothesised effects



We include socio-psychological variables identified as important for other types of behaviour and build on insights from payment literature. Socio-psychological models are developed to understand behaviour and to explain why general attitudes don't predict behaviour well. According to the Theory of Reasoned Action (TRA) both attitudes and subjective norms are factors behind behavioural intention (Fishbein and Ajzen 1975). Behavioural intention mediates the effects of attitude, subjective norm and demographics on behaviour. The Theory of Planned Behaviour (TPB) extends this model by including perceived control as a relevant factor in explaining human behaviour (Ajzen 1985, 1991). Although TPB is the most widely known and used social-psychological model (Darnton 2008), it lacks factors which we know to be very

important, such as emotions and habit. Triandis' Theory of Interpersonal Behaviour (TIB) includes a broader set of factors (Triandis 1977). Our model of payment behaviour incorporates most of the factors put forward by these two commonly used models. Furthermore, we follow guidelines on how to measure socio-psychological variables (Ajzen 2013). In addition, we incorporate insights from payment literature by modelling perceived attributes, such as safety and user-friendliness, as a driver of the attitude towards a particular payment mode and including control variables.

Perceived attributes as drivers of attitude

The first goal we have with this model is to explain consumers' attitudes towards a particular payment instrument. We include perceived attributes as the drivers of attitudes. We foresee that ceteris paribus consumers who associate attributes such as safety and speed with paying electronically have a more positive attitude towards this method of payment than consumers who perceive paying electronically as slow and unsecure and instead perceive paying cash as quick and safe.

Drivers of payment intention

Attitude is one of our model's seven socio-psychological determinants of payment intention. We expect that the more positive someone's attitude towards a particular payment instrument is, the stronger the intention to use it is. For example, if you believe it is a good idea to pay electronically you are more likely to intend to pay this way than when you think it is a bad idea to pay electronically. A meta-analysis by Glasman and Albarracín (2006) shows that future behaviour has a stronger correlation with stable attitudes that are easy to remember than with attitudes that are more difficult to recall and unstable. Because most consumers make various payments during the week, we expect that attitudes are relatively easy to remember and that they have a positive effect on payment behaviour via intention.

We also include social norms as drivers of payment intention. Both injunctive and descriptive norms are elements of our model and we anticipate finding positive relationships between these norms and payment intention. Injunctive norms refer to the perception about what behaviour is expected, whereas the second type of norm captures what other people do (Cialdini et al. 1990). Research in other fields shows that consumer behaviour depends on both norms. For example, both injunctive and descriptive norms affect eating behaviour: how much you eat and what you choose to eat (for an overview of this strand of literature see Higgs 2015). We expect that social norms affect payment behaviour too. Regarding injunctive norms, it may be that perceptions about which payment instrument others endorse affect payment behaviour. For example, bus drivers in Amsterdam want to get rid of cash fares, and went on a strike after several

robberies. This may have affected social norms, with more travellers thinking that the injunctive norm is to pay electronically. There are various other channels that may influence injunctive norms, from mass media campaigns to chats with the check-out operator on how to pay. Regarding descriptive norms, we expect to find a positive relationship; people following the payment behaviour of others, for example friends.

Furthermore, we include a factor labelled *roles*. This refers to the appropriate behaviour determined by someone's position within a social group (Triandis 1977). We expect to find that the intention to pay electronically is stronger for consumers who consider that paying electronically is appropriate behaviour for someone of their own age group, income, lifestyle and neighbourhood than for consumers who find paying cash suitable behaviour.

Personal norm is another socio-psychological factor in our model. We hypothesise that the stronger one's personal norm that payment with a particular instrument should always be possible, the stronger the intention is to pay accordingly.

Furthermore, we include emotions as a driver of payment intention. We expect that the stronger the positive emotions about a particular payment instrument are, the stronger the intention is to pay with this payment instrument. There are a couple of studies that research to what extent different payment modes generate different feelings. Prelec and Loewenstein (1998) discuss the "pain of paying". This "pain" is felt more strongly when paying cash than when paying by card. In the latter case the actual costs of the transaction is obscured because of a lack of transparency (the decoupling effect). Van der Horst and Matthijsen (2013) examine the response of the brain to videos with cash and debit card payments. This neuroscientific research shows that paying cash triggers more positive emotions than paying by debit card. Kahn et al. (2015) build a measurement scale to capture consumers' cognitive and emotional associations with cash and cards. The underlying survey includes questions to measure various emotions, for example feelings of pleasure, sensation and sophistication and whether someone feels confident, secure, and relaxed when opting for different payment modes.

The last driver of payment intention in our model is perceived control. This is an important factor behind human behaviour (Chipperfield et al. 2012). We expect that the stronger the perceived control over paying with a particular payment instrument is, the stronger the intention to use this instrument. Perceived control captures not only the acceptance of a payment mode but also other factors such as the extent to which one expects technical difficulties to occur.

Drivers of behaviour

As is common in socio-psychological models that explain behaviour, we foresee a positive relationship between intention and behaviour. Regarding payment behaviour, we expect that consumers with a strong intention to pay electronically are more likely to actually pay

electronically than consumers with a strong intention to pay cash. Wood and Quinn (2005) show that the predictive power of intentions for actual behaviour depends on how often the behaviour is performed and the setting.

Besides intention, we incorporate actual control and habit in our model as drivers of actual payment behaviour. Unsurprisingly, we expect to find higher levels of control over electronic payments associated with more electronic payments, and higher levels of control over cash payments associated with more cash payments. We also hypothesise a positive relationship between habits and payment behaviour. For example, suppose two consumers intend two pay mostly electronically, one consumer with strong cash habits and one with strong electronic habits. Then, we expect that the consumer with strong cash habits is less likely to pay electronically than the consumer with strong electronic habits. Van der Horst and Matthijsen (2013) show that paying in cash or by card is largely habitual. They find that automatic behaviour as a result of repeatedly performing a task is a very important determinant of paying cash. Van der Cruijsen et al. (2016) find that the habit of paying cash plays a crucial role in explaining consumers' overestimation of debit card usage and therefore why payment behaviour changes slower than expected. Triandis (1980) argues that habits are likely to develop through frequent behaviour. Since this is the case for payments we expect habits to play an important role.

3. Description of data

Survey data

To measure payment intention and actual behaviour we conducted two separate surveys of a representative sample of the Dutch-speaking population in the Netherlands: the CentERpanel.[1] This panel is managed by CentERdata, a research institution that is affiliated to Tilburg University.[2] This panel has been widely used by researchers and policymakers to build up knowledge on various topics.[3, 4] Our first survey included questions to measure consumers' payment intention in the next two weeks and socio-psychological factors. This survey was held in September 2015 (week 38 and 39).[5] It was completed by 2,322 respondents, which represents a

[1] The questionnaires are available on request.

[2] For more information on the CentERpanel, see Teppa and Vis (2012) and http://www.centerdata.nl/en/projects-by-centerdata/the-center-panel. URL last accessed on 13 July 2016.

[3] For example, Hurd et al. (2011) investigate stock market expectations, Von Gaudecker (2014) examines households' portfolio diversification, Georgarakos et al. (2014) research the impact of social interactions on debt and Van der Cruijsen et al. (2012) study the impact of crisis experiences on savings behaviour.

[4] An advantage of the CentERpanel is that background information on the respondents can be found in the annual DNB Household Survey (DHS). This survey is filled in by the CentERpanel and exists for more than two decades. For more information on the DHS see http://www.centerdata.nl/en/projects-by-centerdata/dnb-household-survey-dhs. URL last accessed on 13 July 2016.

[5] September and October are good months to study payment behaviour because payment behaviour in these months reflects average payment behaviour throughout the year well. This is in contrast to for example December when consumers make a lot of purchases related to the festive period and the share of electronic payments is larger than

response rate of 76.7%.[6] The second questionnaire examines actual payment behaviour. It was sent out two weeks after respondents completed the first questionnaire. In week 41 the second survey was also sent out to panellists who did not complete the first survey and to those who did not respond in week 40. The second questionnaire was completed by 2,302 respondents (response rate: 81.1%).[7] For 2,133 respondents we have answers to both questionnaires. In 1,978 cases there were two weeks between the two surveys and in 155 cases the gap was three weeks. We take this into account in our analysis.

The situation in the Netherlands

In the Netherlands, there are two commonly used payment instruments at POS: the debit card and cash. In 2015, 49.5% of the point-of-sale (POS) purchases were paid in cash, 50% by debit cards and 0.5% by credit card (DNB/DPA 2016).[8][9] There are large differences between sectors. For example, at petrol stations consumers made 72% of their purchases by debit card, 24% in cash and 3% by credit card, whereas in the catering industry 37% is paid by debit card, 71% in cash and 1% by credit card.

These days, the degree of acceptance of the debit card among merchants is high but credit card acceptance is still fairly moderate in the catering industry and among smaller shops (Panteia 2015).[10] All Dutch consumers have a current account with a debit card.[11] The debit card was introduced in 1987 to withdraw money from automated teller machines (ATMs).[12] Since 1990 it has been possible to pay by debit card in shops. Initially, the debit card was used for payments with a high value. In 2005 banks and merchants agreed to jointly promote debit card payments by removing surcharges on low-value payments, increasing the acceptance, and the set-up of the Foundation for the Promotion of Efficient Payments.[13] Public campaigns such as "Small amount? Debit card allowed!" were launched. Gradually, consumers started to use the debit card more and

normally, see http://www.dnb.nl/en/binaries/Factsheet%20Point%20of%20sale%20payments%202015_tcm47-341312.pdf?2016071311. URL last accessed on 13 July 2016.

[6] There were 23 incomplete responses.

[7] There were 6 incomplete responses.

[8] In 2014 the option to use the debit card to make contactless payments was introduced.

[9] Our survey includes questions to measure attitude, intention, behaviour and other socio-psychological factors for cash and electronic payments. We do not distinguish between debit card and credit card payments because the share of credit card payments is very small. This approach prevented a too lengthy survey and simplifies our empirical analysis. However, we realize that in countries where there are more than two often-used payment modes, it is best to use another empirical strategy.

[10] These are the 2014 figures for the debit card: petrol stations and large retail chains: 100%, small and medium sized shops: 97%, catering industry: 80%, and market vendors: 55%. The degree of acceptance of the credit card was 95% among petrol stations, 83% among large retail chains, and less than 40% in the catering industry and among smaller shops.

[11] The credit card is adopted by about half of the Dutch consumers.

[12] Dutch consumers don't have to pay their issuing bank transaction fees for payments in the euro area and fees for withdrawing cash from the ATM.

[13] There are only few merchants left who surcharge payments (Hoofdbedrijfschap Detailhandel 2012).

more, also for low-value payments. In 2014 merchants and banks agreed to strive for a ratio of debit card payments relative to cash payments of 60% to 40% by 2019.

In the Netherlands most consumers prefer an electronic payment mode (Van der Cruijsen et al. 2016.). However, this is not reflected in actual behaviour; a substantial share of consumers mostly pay cash despite this preference and the absence of surcharges. This finding indicates that socio-psychological factors may play a role.

4. Model elements: measurement and outcomes

Although our model can be applied to explain the use of any payment mode, we use data on cash and electronic payments to test this model and gain insights on the choice between cash and electronic payments.

Intention

Payment intentions are measured by asking respondents: "How do you intend to pay at point-of-sales *the next two weeks*?" Table 1 summarizes the answers. For payments in general we find that most respondents intend to pay mostly electronically. Only 5% of the respondents intend to always pay cash. We construct the variable *intention*. This variable ranges from 1 to 5, from always cash to always electronically.

Paired t-tests show that the payment intention significantly depends on the type of retailer and the transaction size (p=0.00). Substantially more respondents intend to pay cash at catering establishments than at supermarkets. The intention to pay electronically is stronger for large transactions than for small transactions.

Table 1. Payment intention

How do you intend to pay at point-of-sales in the next two weeks?

	In general	< EUR 10	≥ EUR 10	supermarket	catering establishment
Always cash	5%	14%	5%	8%	9%
Mostly cash	13%	27%	10%	10%	18%
As often cash as electronically	18%	17%	14%	9%	16%
Mostly electronically	54%	31%	49%	29%	32%
Always electronically	11%	11%	22%	44%	24%
Number of observations	2232	2232	2232	2204	1989

Source: CentERpanel, September 2015.

Our baseline empirical model explains payment intention and behaviour *in general*. We estimate our model tailored towards low-value payments, payments with a high value, payments at supermarkets or payments at catering establishments to test whether we have robust conclusions (see Section 6). As from now, the discussion of model elements focusses on our

baseline model and the respondents who completed all questions required to estimate this model. Table A.1 in Appendix A contains a detailed description of all model variables, their mean, minimum value, maximum value, and standard deviation.

Drivers of intentions

We construct a relative attitude measure by subtracting the answer to "Paying cash is a good idea." from the answer to "Paying electronically is a good idea.". Both statements are measured on a 1 (completely disagree) to 5 (completely agree) scale. The variable *attitude* is 0 for respondents who have the same attitude towards paying cash and paying electronically. It is smaller than 0 for consumers with a relatively negative attitude towards paying electronically and larger than 0 for consumers with a relatively positive attitude towards this way of paying. On average, respondents have a more positive attitude towards paying electronically than towards paying cash. 71% agree or completely agree that paying electronically is a good idea compared to 24% in the case of cash.

Next, we use the survey outcomes presented in Table 2 to establish the driver of *attitude*: *perceived attributes*. We distinguish seven attributes and for each of these we asked panellists to indicate whether they associate the attribute most with paying cash, paying electronically or whether there is no difference. We also have information on the importance of each attribute, from 1 (not important at all) to 5 (very important).

Table 2. Perceptions of attributes

Which payment method do you associate most with the attributes listed below?							
	Fast	Safe	Easy	Cheap	Control of expenses	Provides privacy/ anonymity	Well-accepted
paying cash	13%	15%	11%	26%	41%	58%	13%
no difference	31%	29%	29%	50%	29%	24%	56%
paying electronically	56%	56%	60%	25%	30%	18%	31%
How important do you find these attributes?							
	Fast	Safe	Easy	Cheap	Control of expenses	Provides privacy/ anonymity	Well-accepted
Not important at all	2%	0%	0%	0%	1%	1%	0%
Unimportant	9%	0%	1%	2%	2%	7%	1%
Neutral	26%	6%	12%	24%	17%	32%	16%
Important	53%	56%	66%	52%	51%	40%	55%
Very important	11%	37%	21%	22%	29%	20%	28%
Ranking importance	7	1	3	5	4	6	2

Source: CentERpanel, September 2015.
Note: The number of observations is 2239. We rank the importance of attributes based on the average answer to the question "How important do you find these attributes?"

Table 2 shows that there are many more respondents who find the attributes "fast", "safe", "easy", "well-accepted" better suited for paying electronically than for paying cash. In contrast,

"control of expenses" and "provides privacy/anonymity" is associated more often with cash than with electronic payments. The financial incentive to choose a particular payment instrument is captured by perceptions about costs. Half of the respondents perceive no difference in the costs of cash and electronic payments, 1 out of 4 respondents associate cheap with cash and also 1 out of 4 associate cheap with electronic payments. On average, respondents find safety the most important attribute. Well-accepted ranks second.[14] It is also noteworthy that only a small share of consumers consider any of the attributes "unimportant". Based on this information, we construct the variable *perceived attributes*, which ranges between 0 and 1. The minimum of 0 is assigned to respondents who find all attributes unimportant and/or associate all attributes most with cash. The maximum of 1 is assigned to respondents who find all attributes very important and associate them most with electronic payment instruments.

To measure injunctive norms, we asked panellists "How do you think others would want you to pay?" We distinguish eight different "others": check-out operators (<EUR 10), check-out operators (≥EUR 10), catering staff (<EUR 10), catering staff (≥EUR 10), the government, own bank, storekeepers, and catering establishment owners. Respondents could answer cash, electronically or that they think others are indifferent towards whether they use cash or electronic payment modes. The first section of Table 3 shows the responses, with 4 out of 5 respondents thinking that the government and their own bank want them to pay electronically. The share is slightly lower with respect to storekeepers and substantially lower in the case of catering establishment owners. There is a small share of respondents who think that preferences of check-out operators depend on the transaction size. In contrast, for many respondents injunctive norms regarding catering staff clearly depend on the transaction size. Whereas 46% of the respondents think catering staff want them to use cash for small transactions, and only 24% think they want them to pay electronically, in the case of large payments this result is reversed.

We also collected information on the motivation to comply with these norms (second part of Table 3). In general, a substantial share of respondents indicate that they don't care about the opinions of these others, between 34% and 37% take a neutral position and slightly more than 1 out of 5 respondents state that they want to comply with these injunctive norms. To construct the variable *injunctive norms* we use the answers to this second question to weigh the norms in each situation. The weights range between 1 (completely disagree) and 5 (completely agree). The eight norm variables range between 0 and 2. A norm variable is 0 when the norm is paying cash, 1 when it is perceived that others don't care how one pays and 2 when the norm is paying electronically. The sum of all weighted norms is divided by 80 to obtain a variable that ranges between 0 and 1.

[14] Note that Dutch consumers find the attribute "cheap" less important than several other attributes. This may explain why the debit card is still more popular for large transactions than for small transactions despite the abolition of surcharges. It also indicates that to successfully steer payment behaviour it is important to not only focus on price incentives.

Injunctive norms is 0 if one thinks that all others want cash payments and 1 if one thinks that all others prefer electronic payments *and* one completely agrees that the opinions of all others matters.

Table 3. Injunctive norms

How do you think others would want you to pay?								
	Check-out operators (<EUR 10)	Check-out operators (≥EUR 10)	Catering staff (<EUR 10)	Catering staff (≥EUR 10)	Govern-ment	Own bank	Store-keepers	Catering owners
Cash	9%	2%	46%	23%	1%	1%	3%	18%
Indifferent	39%	31%	31%	32%	19%	18%	19%	29%
Electronically	51%	66%	24%	45%	80%	81%	77%	53%

I like to pay the way … want me to pay						
	Check-out operators	Catering staff	Govern-ment	Own bank	Store-keepers	Catering owners
Completely disagree	13%	12%	15%	15%	12%	12%
Disagree	31%	30%	30%	30%	28%	29%
Neutral	35%	36%	35%	34%	35%	37%
Agree	17%	19%	17%	17%	20%	18%
Completely agree	4%	4%	4%	4%	4%	4%

Source: CentERpanel, September 2015.
Note: The number of observations is 2186.

Next, we formulate the variable *descriptive norms*. Panellists indicate their perceptions of the payment behaviour of their partner, friends, family, colleagues, and other customers. We also measure to what extent they want to adopt this behaviour. Table 4 shows the outcomes of the underlying questions. On average, respondents think that particularly their friends use electronic payment instruments often. A small part of the respondents indicate that they want to follow the payment behaviour of others. The wish to follow one's partner is the strongest. Of the respondents with a partner and a perception of his/her payment behaviour 17% want to pay in a similar way.

Based on this information, we construct the variable *descriptive norms*. To do so, we first make a descriptive norm for each other category. Each of these descriptive norms ranges between 1 (always cash) to 5 (always electronic). Next, we multiply each norm by the degree to which one wants to follow this payment behaviour. These weights range between 1 (completely disagree) and 5 (completely agree). Lastly, we calculate the average weighted norm and divide the outcome by 25, so *descriptive norms* range between 0.04 and 1. The minimum value is given to respondents who find the behaviour of all others not at all important and think that all others always pay cash. Respondents who find the behaviour of all others very important and think that all others always pay electronically have a descriptive norm of 1.

Table 4. Descriptive norms

How do you think others in your environment pay?					
	Partner	Friends	Family	Colleagues	Other customers
Always cash	4%	1%	1%	0%	1%
Mostly cash	10%	4%	6%	2%	2%
As often cash as electronically	17%	27%	34%	23%	35%
Mostly electronically	40%	53%	45%	43%	45%
Always electronically	10%	9%	7%	7%	6%
Not applicable	19%	7%	7%	25%	11%
I like to pay in a similar way as...					
	Partner	Friends	Family	Colleagues	Other customers
Completely disagree	16%	19%	18%	18%	20%
Disagree	23%	25%	25%	24%	25%
Neutral	44%	49%	50%	50%	49%
Agree	14%	6%	5%	6%	6%
Completely agree	3%	1%	1%	1%	1%

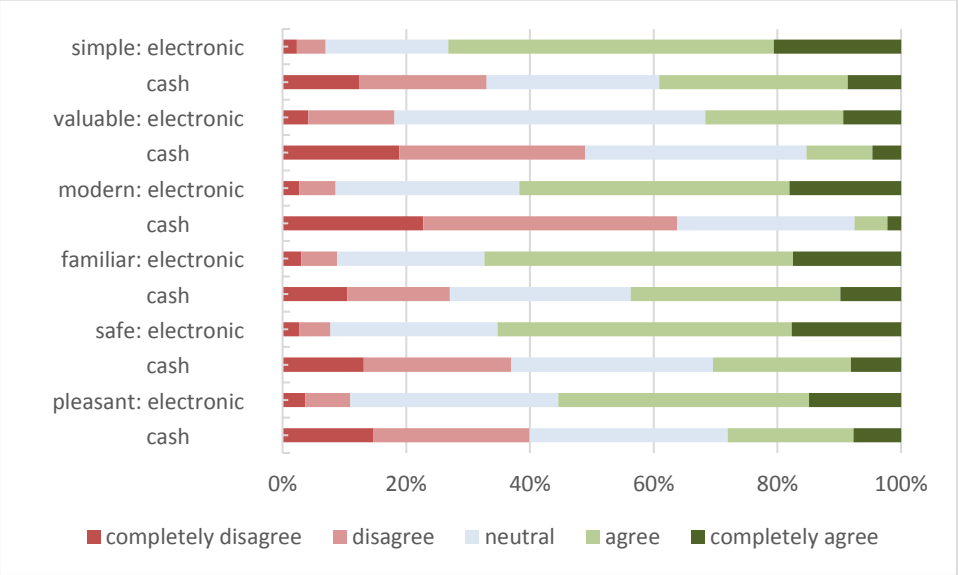
Source: CentERpanel, September 2015.
Note: The number of observations is 2186 in the case of the first question. The second question is only answered by respondents who did not opt for not applicable.

Then, we build the variable *Roles*. It is the average answer to four statements that measure respondents' perceptions of best-suited payment behaviour of someone (1) their age, (2) their income, (3) their lifestyle, or (4) from their neighbourhood. All four underlying statements are measured on a scale from 1 (always cash) to 5 (always electronic). Therefore, *roles* is 1 if one answers always cash in all cases and 5 for respondents who answer always electronically in all cases. Most respondents find paying electronically or as often cash as electronically best-suited payment behaviour. Respondents perceive paying electronically to be especially well-suited for people with the same lifestyle and income.

Respondents' personal norm is measured by using their agreement with two statements: "It should always be possible to pay cash." and "It should always be possible to pay electronically.". Both statements are measured on a 1 to 5 scale, from completely disagree to completely agree. The share of respondents that opt for agree or completely agree is larger for electronic payments than for cash payments: 69% versus 59%. Only 11% disagree or completely disagree that it should always be possible to pay electronically, compared to 23% in case of cash. By subtracting the answer to the question about paying cash from the answer to the question about paying electronically we construct the variable *personal norm*. On average, its value is 0.29, which reflects the relatively strong personal norm for electronic payments.

Subsequently, we construct the variable *emotions*. In our survey we distinguish six different positive emotions and ask to what extent panellists agree with twelve statements: "Paying [electronically/cash] feels [pleasant/safe/familiar/modern/valuable/simple].". Answers range from 1 (completely disagree) to 5 (completely agree). Figure 2 summarizes the results.

Figure 2. Emotions



Source: CentERpanel, September 2015.
Note: The number of observations is 2186.

For each of the emotions we subtract the answer about paying cash from the answer about paying electronically. The average of these six variables is our relative emotions measure. *Emotions* is 0 when emotions associated with cash payments and those related to electronic payments are the same. On average *emotions* is 0.85, which implies that the measured positive emotions are stronger for electronic payments than for cash payments. Based on six paired t-tests we conclude for each emotion that it is felt stronger for electronic payments than for cash payments (all p-values are 0.00). In other words, paying electronically feels more modern than paying cash but also more pleasant, safe, familiar, valuable and simple. The largest difference between cash and electronic payments is for the feeling "modern". The difference in perceived pleasure confirms previous research on the pain of paying (Prelec and Loewenstein 1998).

The last determinant of payment intentions in our model, perceived control, is formulated by subtracting the answer to "I think it is … possible to pay cash." from the answer to "I think it is … possible to pay electronically.". The answers to these two questions range from 1 (never) to 5 (always). On average we find for both cash and electronic payments that the perceived control is between "mostly" and "always". Our relative measure *perceived control* is 0 for respondents who perceive the degree of control to be the same for cash and electronic payments. On average *perceived control* is -0.10, so the perceived control of cash payments is slightly better than that of electronic payments (paired t-test, p=0.00).

Behaviour

To measure actual payment behaviour, in our second survey we asked how people had actually paid in the previous two weeks. The answers are as follows: 6% always cash, 13% mostly cash,

19% as often cash as electronically, 51% mostly electronically and 10% always electronically. The variable *behaviour* ranges from 1 (always cash) to 5 (always electronically). For 31% of the respondents we observe a difference between his/her payment intention and actual payment behaviour. Furthermore, we find that there are significantly more respondents who paid less often electronically than intended than respondents who paid more often electronically than intended. This is in line with the findings of Van der Cruijsen et al. (2016), which indicate that a substantial share of Dutch consumers prefer the debit card but mostly use cash.

Note that respondents' reported actual payment behaviour may not perfectly match their true payment behaviour. Some respondents may misperceive their actual payment behaviour. For example, they may only recall the most recent payments, which blurs their overall idea of how they paid in the past two weeks. Respondents may also report actual payment behaviour that is more in line with their intention than their true payment behaviour is. To the extent that the latter is the case, we underestimate the presence of a gap between payment intention and actual payment behaviour and overestimate the effect of intentions on actual behaviour. Therefore, the direct effects of habit and control on actual payment behaviour may be considered as lower bounds and the effect of intentions on actual behaviour as upper bound. Respondents may be better in remembering their last transaction. We asked whether the last POS transaction was paid cash or electronically and find a strong positive correlation between this measure of actual payment behaviour and the one included in our analyses (Spearman's rho: 0.57; p=0.00).

Drivers of behaviour

Regarding the drivers of behaviour, we construct measures of habit and actual control in addition to *intention*, which we discussed before. Our survey includes three questions to measure the strength of cash habits and three questions to measure the strength of the habit of paying electronically. We use this information to formulate *habit*, which reflects the average of three relative habit measures: (1) the degree of agreement with "I often pay electronically." minus the degree of agreement with "I often pay cash.", (2) the degree of agreement with "I have already been paying electronically for a long time." minus the degree of agreement with "I have already been paying cash for a long time.", and (3) the degree of agreement with "I pay electronically out of habit." minus the degree of agreement with "I pay cash out of habit.". All these underlying statements are measured on a 1 (completely disagree) to 5 (completely agree) scale. Respondents with *habit* smaller than 0 have stronger cash habits than electronic habits. If the habit strength is the same for both payment methods *habit* is 1. On average *habit* is 0.72 which implies that the habit of paying electronically is stronger than the cash habit.

We survey actual control in our second questionnaire. We construct two binary dummy variables: *actual control electronic* and *actual control cash*. *Actual control electronic* is 0 for

respondents who experienced a situation in which they wanted to pay electronically but could not pay electronically, and 1 for respondents who had actual control of electronic payments. Similarly, we construct *actual control cash*. The most often mentioned reason for lack of control over electronic payments is that there was no payment terminal, whereas not enough cash on hand was the main reason for lack of control over cash payments. Actual control over payments turns out to be high in the Netherlands; only 2% of the respondents who are included in our regression analyses experienced a situation in which they could not pay cash and 3% experienced a situation in which they could not use the electronic payment instrument that they wanted to use.

Background characteristics

In our model we include controls for background characteristics. Previous research has clearly shown that payment behaviour is related to these characteristics. We include *male*, four age dummies, *education, income*, *city* and *responsible for finances* in our baseline estimations as explanatory variables for attitudes, intentions and actual behaviour. We refer to Table A.1 in Appendix A for a description of these variables and their descriptive statistics.

5. Regression results

Baseline model

We find that the model is well-suited to explain consumers' payment attitudes, intentions and behaviour and that the signs of the effects are in line with our expectations.[15] Table 5 show the effects that we find when we estimate a generalized structural equation model. Since intentions and behaviour are measured on an ordered 1 to 5 scale we use ordered logit models to estimate these variables. Attitude is measured with a linear regression. Figure 3 summarizes the regression results.

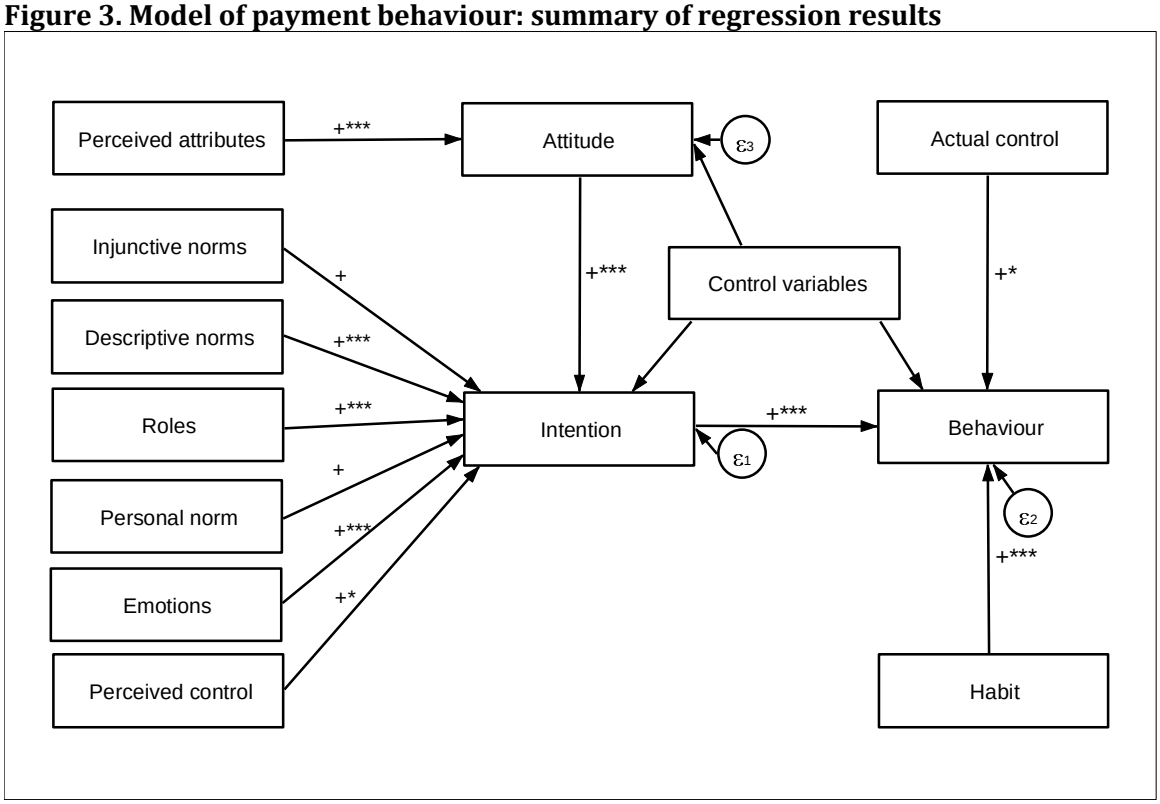
[15] We find that multicollinearity is not a problem. The mean Variance Inflation Factor (VIF) is 1.43 for the explanatory variables of attitude, 2.13 for the explanatory variables of intention and 1.36 for those of behaviour. Overall, the minimum VIF is 1.01 and the maximum is 6.43. As a rule of thumb a VIF smaller than 10 is fine.

Table 5. Payment attitude, intention and behaviour: regression results

	Attitude	*Intentions*	*Behaviour*
Male	-0.06	0.26**	-0.01
	(0.06)	(0.10)	(0.11)
34 and below	0.07	0.10	-0.11
	(0.10)	(0.20)	(0.22)
Between 35 and 44	0.08	-0.22	-0.18
	(0.09)	(0.16)	(0.16)
Between 55 and 64	0.05	-0.27*	-0.15
	(0.08)	(0.15)	(0.15)
65 and over	0.06	-0.62***	-0.31**
	(0.08)	(0.14)	(0.14)
Education	0.15**	0.24**	0.09
	(0.06)	(0.10)	(0.11)
Income	0.04***	-0.04*	0.01
	(0.01)	(0.02)	(0.02)
City	0.01	-0.00	-0.03
	(0.02)	(0.03)	(0.04)
Responsible for finances	0.09	0.07	-0.05
	(0.06)	(0.10)	(0.11)
Perceived attributes	5.07***		
	(0.13)		
Attitude		0.23***	
		(0.07)	
Roles		1.29***	
		(0.11)	
Injunctive norms		0.37	
		(0.29)	
Descriptive norms		1.54***	
		(0.35)	
Personal norm		0.02	
		(0.04)	
Emotions		0.87***	
		(0.09)	
Perceived control		0.15*	
		(0.08)	
Intention			1.62***
			(0.10)
Habit			0.77***
			(0.06)
Actual control electronic			0.45*
			(0.26)
Actual control cash			-0.03
			(0.28)
Week dummy			-0.13
			(0.21)
Constant	-1.68***		
	(0.11)		
Observations	2239	2186	2036
R^2/Pseudo R^2	0.47	0.34	0.39
F-statistic	163.50***		
Wald χ^2		1152.91***	950.48***
Log Pseudolikelihood		-7152.83	

Note: This table reports parameter estimates for a generalized structural equation model. Attitude is estimated with a linear regressions and intentions and behaviour are estimated using ordered logit models. In total 2242 observations are included. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure 3. Model of payment behaviour: summary of regression results



Note: *** p<0.01, ** p<0.05, * p<0.1.

Attitude

First of all, we find that perceived attributes matter for the attitude towards paying electronically compared to paying cash. Respondents who think that the attributes (fast, safe, easy, cheap, control of expenses, provides privacy/anonymity, and well-accepted) are more typical of cash than of electronic payments are more likely to have a relatively positive attitude towards paying cash. This finding is in line with previous research showing that differences in perceived payment attributes are significantly related to the adoption of payment instruments and the intensity of use (see e.g. Kosse 2014 for an overview of the literature).

Intentions

Five out of seven model elements have the expected positive and significant effect on the intention to pay electronically in the next two weeks. Firstly, we find that the higher the positive attitude towards paying electronically is, the stronger is the intention to pay electronically. Secondly, descriptive norms matter. Respondents who think that relevant others pay electronically and want to follow this behaviour report a stronger intention to pay electronically than respondents who think that relevant others pay cash. Thirdly, the intention to pay electronically also depends on the variable *roles*. For example, respondents who think that it is well-suited for someone of their age, income, lifestyle and neighbourhood to mostly pay electronically report a stronger intention to pay electronically than respondents who think it is well-suited for their peers to

mostly pay cash. Fourthly, the intention to pay electronically is higher for respondents with relatively positive emotions towards paying electronically than for respondents who feel the emotions pleasant, safe, familiar, modern, valuable and simple stronger when paying cash than when paying electronically. Lastly, the stronger the relative perceived control of paying electronically is, the stronger is the intention is to pay electronically. The coefficients of *personal norm* and *injunctive norms* are positive but insignificant.

The most important driver of payment intentions is *emotions.* The explanatory power of *roles* and *attitude* is also strong compared to the explanatory power of social norms, personal norm and perceived control. To examine the importance of each socio-psychological factor in explaining payment intentions, we estimated seven regressions, one for each factor. These regressions include the background variables and the socio-psychological factor of interest. We measure the relative quality of the models by assessing Akaike's Information Criterion (AIC, Akaike 1974). The results are in Table B.1 of Appendix B.

Based on our baseline estimations, Table 6 shows the marginal effects for the drivers of payment intentions. Row 1 shows the effects of an increase of *attitude* by 1 on the estimated probability of falling in a particular payment intention category. For example, if *attitude* increases by 1, the likelihood of having an intention to pay mostly electronically increases by 1.51 percentage points. Note that an increase of *attitude* by 1 is either a one category higher agreement with "Paying electronically is a good idea." or a one category lower agreement with "Paying cash is a good idea.". The more positive the attitude towards paying electronically compared to paying in cash is, the lower the likelihood of falling into the "always cash", "mostly cash", or "as often cash as electronic" category is and the higher the likelihood of falling into the "mostly electronic" or "always electronic" category is. The conclusions for *descriptive norms*, *roles*, *emotions*, and *perceived control* are similar (see Table 6, row 3, 4, 6 and 7). The same pattern is also found for *injunctive norms* and *personal norm* but the marginal effects are insignificant (see Table 6, row 2 and 5).

Table 6. Marginal effects of socio-psychological factors on payment intentions

Effect of an increase of the socio-psychological factor in column 1 by 1 on the likelihood of falling in a particular intention category (in percentage points)

	Intention category				
	Always cash	*Mostly cash*	*As often cash as electronically*	*Mostly electronically*	*Always electronically*
(1) *Attitude*	-0.53***	-1.28***	-1.08***	1.51***	1.37***
(2) *Injunctive norms*	-0.85	-2.06	-1.74	2.44	2.20
(3) *Descriptive norms*	-3.52***	-8.56***	-7.23***	10.15***	9.16***
(4) *Roles*	-2.95***	-7.18***	-6.06***	8.51***	7.68***
(5) *Personal norm*	-0.04	-0.10	-0.08	0.11	0.10
(6) *Emotions*	-1.98***	-4.80***	-4.06***	5.70***	5.14***
(7) *Perceived control*	-0.34*	-0.82*	-0.69*	0.97*	0.87*

Note: ***p<0.01, **p<0.05, *p<0.1.

Behaviour

The signs of the drivers of payment behaviour are also in line with our hypotheses (see Figure 3 and Table 5). First of all, there is a strong significant positive relationship between payment intentions and actual payment behaviour. People with a stronger intention to pay electronically are more likely than others to actually pay more often electronically.

The extent to which a respondent paid electronically in the past two weeks also depends on habits. Although intentions are the most important driver of actual payment behaviour, the explanatory power of *habits* is also strong (see Appendix B, Table B.2). Respondents with a relatively strong habit of paying electronically used electronic payment instruments more intensively than respondents with a relatively weak habit of paying electronically.

There is a positive and significant effect of *actual control electronic* on payment behaviour. There are several explanations why this effect is only significant at the 10%-level and why *actual control cash* is insignificant. As we mentioned before, only a small share of consumers experiences a lack of control. Therefore, experiencing a lack of control may be insufficient for shifting payment behaviour from one category to another, for example, from paying mostly electronically to paying as often in cash as electronically.[16]

Our model significantly outperforms a commonly used model to explain payment behaviour: a model that only includes perceived attributes and control variables. The model with a wide range of socio-psychological factors has a better fit. The pseudo R^2 is 0.39, whereas a basic model yields an R^2 of 0.18, which is similar to the fit of regression models in previous studies on payment behaviour. Based on a likelihood-ratio test we conclude that the explanatory power of the extended model is better than the explanatory power of the basic model (χ^2 Δ log-likelihood=1133.02; p-value=0.00), see Table C.3 in Appendix C.

Based on the baseline estimations, Table 7 displays the marginal effects of the drivers of payment behaviour. Table 7 row 1 shows the effects of an increase of intentions by 1 on the estimated probability of falling in a particular payment behaviour category. For example, we find that if intentions are 1 higher, so one category higher, the likelihood of always paying electronically is 10.07 percentage points higher. The stronger the intention to pay electronically is, the larger the likelihood is that someone falls in the "mostly electronically" or "always electronically" category. A similar pattern conclusion holds for *habit* (Table 7, row 4) and *actual control electronic* (Table 7, row 2). As expected, the table reports opposite signs for the marginal effects of *actual control cash*. These effects are insignificant (Table 7, row 3).

[16] Furthermore, it might be that general intentions differ from the specific payment intentions consumers had in the situation where they could not pay the way they wanted to pay.

Table 7. Marginal effects of intention, actual control and habit on payment behaviour
Effect of an increase of the socio-psychological factor in column 1 by 1 on the likelihood of falling in a particular behaviour category (in percentage points)

	Behaviour category				
	Always cash	*Mostly cash*	*As often cash as electronically*	*Mostly electronically*	*Always electronically*
(1) *Intention*	-4.80***	-5.37***	-7.07***	7.17***	10.07***
(2) *Actual control electronic*	-1.34*	-1.50*	1.98*	2.01*	2.82*
(3) *Actual control cash*	0.08	0.09	0.12	-0.12	-0.17
(4) *Habit*	-2.29***	-2.57***	-3.38***	3.42***	4.81***

Note: ***p<0.01, **p<0.05, *p<0.1.

By estimating our socio-psychological model we also get better insight in how payment behaviour depends on background characteristics. We find that various effects of background characteristics are indirect; they affect payment behaviour via their effect on consumers' attitudes and/or payment intentions. The attitude towards paying electronically is higher for respondents with a high level of education than for respondents with a low level of education. Furthermore, it is higher for high-income respondents than for low-income respondents. However, given one's attitude income has a negative effect on the intention to pay electronically. We also find that respondents in the oldest age classes report a weaker intention to pay electronically than respondents in the reference category (*between 45 and 54*). Given one's attitude, higher-educated respondents have a stronger intention to pay electronically than lower-educated respondents. The same holds for males in comparison to females. Given the intention to pay electronically, we find that older respondents less often choose to pay electronically than respondents in the reference group.

Detailed model

We rerun the model with roles, emotions and habits in a more detailed manner. These results are available upon request. Regarding roles, instead of one aggregated measure this specification includes the four underlying measures separately: *roles age, roles income*, *roles lifestyle*, and *roles neighbourhood*. We find that perceptions of best-suited payment behaviour for someone's age and lifestyle have a significant effect on payment attitudes. This model also gives detailed insight into the effect of emotions on payment intentions. We furthermore discover that the emotions pleasant, familiar and simple explain a significant part of consumers' differences in payment intention, whereas the effects of other emotions are insignificant. With respect to habits, the relative frequency of the payment behaviour matters for actual payment behaviour. We also find that consumers who have been using electronic payment instruments for a relatively long time are more likely to often pay electronically than consumers who started using electronic payment instruments more recently. Differences in respondents' self-reported habits explain less of the variation in actual behaviour than the prior two elements of habit.

6. Robustness

Payment behaviour in four specific cases

As a robustness exercise we estimate four alternative models that are specifically tailored towards payment behaviour of (1) transactions of less than EUR 10, (2) transactions of at least EUR 10, (3) transactions at the supermarket, and (4) transactions at catering establishments. We construct and include variables that measure payment intention, actual payment behaviour and injunctive norms in these four cases. Furthermore, we include tailor-made habit and control measures in the supermarket and catering establishment regressions. These control measures only measure to what extent people could pay how they wanted to at the supermarket and catering establishments, but we don't know whether respondents experienced a lack of control regarding cash payments, electronic payments or both. See Table A.2 of Appendix A for a detailed description of these variables. Other variables are the same as the ones in our baseline model (see Table A.1).[17]

For low-value transactions, we find that the same socio-psychological factors drive payment intention and actual payment behaviour as in case of payments in general. The only exceptions are *perceived control* and *actual control electronic*, which are not significant in this model (see the left part of Table C.1 in Appendix C). This may be due to the fact that this variable is not constructed specifically for small transactions. Our finding highlights that a general measure of perceived control does not work well in explaining low-value payment intention. Compared to the baseline regressions, we find additional age effects. Respondents between 35 and 44 years old have a weaker intention to pay small amounts electronically than respondents in the reference group (*between 45 and 54*) and this is also directly reflected in their actual payment behaviour. Furthermore, the negative *between 55 and 64* effect is now significant in the payment behaviour regression.

The results of the model for large transactions confirm the robustness of the socio-psychological effects found after running the baseline model (see the right part of Table C.1 in Appendix C). Again, there are a few shifts in the significance of background variables and *actual control electronic* is insignificant. Regarding intention, the effect of *between 55 and 64* and *income* are not significant. Furthermore, given payment intentions, the payment mode selected for large amounts does not depend on age. Furthermore, we find a direct positive effect of *education* and *income* on the usage of electronic payment instruments in case of high-value payments.

The results of the model for payments at the supermarket also confirm most findings of the baseline model (see left part of Table C.2 in Appendix C). The only difference with respect to

[17] Note that, unfortunately, our survey would have become too long if we would have measured each variable of our model specifically for each of these four situations. However, we realize that ideally one would want to measure each element of our model specifically for a particular POS and transaction amount, to explain attitudes, intentions and behaviour as best as possible.

the socio-psychological drivers of payment intention is that the effect of injunctive norms is significant in the supermarket model. A stronger injunctive norm of paying electronically results in a stronger intention to pay electronically. Again, there are a few changes in the effects of background variables. For example, we find a significant positive effect of income on the intention to use electronic payment instruments in the supermarket and on the actual use of electronic payment modes. Furthermore, we only find an indirect age effect on payment behaviour in the supermarket, namely for those of 65 and over, via a weaker intention to pay electronically.

The model on payment behaviour at catering establishments (e.g. cafes and restaurants) provides further evidence that our socio-psychological model is well-suited to explain payment behaviour (see the right part of Table C.2 in Appendix C). The most noteworthy difference with the baseline model's results is that the effect of injunctive norms is significant, whereas that of attitude is not. Note that we include a general attitude measure. However, it may very well be the case that attitudes towards paying in general and attitudes towards paying at catering establishments differ. These regression results also highlight that the effects of background characteristics depend on the payment situation. The only variable significant in the intention equation is *male* but with the opposite sign as in the baseline model. The intention to pay cash at catering establishments is stronger for males than for females and given payment intention, males also pay more often cash at cafes and restaurants than females.

Overall, the results of these four sets of regressions confirm that socio-psychological factors drive payment intention and payment behaviour. It also highlights the importance of tailor-made variables to take into account differences between POS and the relevance of the transaction sizes. Lastly, an important additional takeaway is that the effects of background characteristics depend on the type of transaction.

Alternative habit measure

The habit effect is robust to the inclusion of an alternative, script-based habit measure (see Verplanken et al. 1994). To construct this habit variable our first survey included a question in which nine different transactions were outlined, each with a different amount to be paid and POS. Respondents had to indicate whether they would opt for cash or an electronic payment mode. The more invariant responses are, the stronger the habit is (Verplanken et al. 1994). We find that the answers depend on the transaction amount and the POS.[18] We use this information to construct *habit 2*, which measures the proportion of transactions paid electronically. It is 0 for respondents who chose cash in all nine situations and 1 for respondents who answered they would always pay electronically. On average respondents would opt for an electronic payment mode in 60 percent

[18] A figure with the response shares is available upon request.

of the nine payments. When we replace *habit* by *habit 2* we again find that the stronger the electronic payment habit is and the weaker the cash habit is, the higher the share of electronically paid transactions is (see the left part of Table C.3 in Appendix C). The effect of payment intention on actual behaviour is still positive and significant. In contrast to the baseline outcomes, there is no significant effect of age and of *actual control electronic*.

Alternative perceived control measure

As an extra robustness test, we use an alternative perceived control measure and find additional support that perceived control is one of the determinants of payment intention. The outcomes are in right part of Table C.3 in Appendix C. Note that the fit of this model is even somewhat better than the fit of our baseline model. Again we include a relative measure of perceived control, so comparing the perceived degree of control of electronic payment instruments with the perceived control of cash. To construct *perceived control 2* we take the average answer to "I expect to have my debit card or credit card with me.", "I expect that there will be a payment terminal.", "I expect that there will be a failure, as a result of which I cannot pay electronically." (reversed scale), "I expect to remember my PIN code.", and "I expect to make payments that I want to keep private." (reversed scale) minus the average answer to "I expect that I will have enough cash on hand.", "I expect that there will be enough change.", and "I expect that cash will be accepted.". The answers to all underlying statements range from 1 (certainly not) to 5 (certainly yes).[19] On average *perceived control 2* is 0.05, so larger than 0, which implies that the perceived control of paying electronically is slightly better than the perceived control of paying cash.

7. Conclusion and policy implications

To conclude, we contribute to payment literature and the policy debate on payments behaviour by showing that a range of socio-psychological factors are important drivers of payment behaviour. Our model is substantially better able to explain consumers' payment behaviour than a model that only includes perceived payment attributes and a wide set of controls.

Firstly, we find that perceived attributes of payment instruments determine consumers' payment attitudes. The attitude towards a particular payment mode can be strengthened by improving perceived attributes, especially by focusing on the perceived safety and acceptance.

Secondly, we show that payment intentions can be steered by focussing on socio-psychological factors. First of all, the intention to pay in a particular way can be strengthened via a more positive attitude towards the payment mode. Secondly, payment intentions can be affected by creating the feeling, for example via media campaigns, that it is the appropriate behaviour of

[19] A figure with the questions and responses is available upon request.

someone one's age and lifestyle to use a particular payment mode. A third approach to influence intentions is via social norms. The stronger someone's perception is that other people use a particular payment mode, the greater the likelihood that they also have the intention to use this payment mode. Fourth, the intention to use a particular payment mode is stronger if consumers experience its usage as pleasant, familiar and simple. It is vital to take these emotions into account when designing or improving a payment method, especially because emotions are the most important socio-psychological driver of payment intentions. Last, by increasing the degree of perceived control over using a payment mode one can increases its use.

Payment behaviour depends on payment intentions, habit and actual control. Our results indicate that to influence payment behaviour one should not only steer payment intentions but also try to break habits. The latter is a challenging task, but setting the desired defaults may help to nudge behaviour (Thaler and Sunstein 2008). Actual control is also relevant for payment behaviour. Stakeholders that want to steer payment behaviour can try to improve control by limiting the failures and increasing the degree of acceptance. But also when developing a payment mode one can take control into account. For example, contactless payment methods improve the control because one does not need to remember a code.

Finally, based on our analysis we conclude that it is important to have a clear picture of what kind of payment behaviour one wants to influence. The effects of socio-psychological factors such as injunctive norms depend on the POS and the transaction amount. We also find that the effects of background characteristics depend on the POS and the value of the transaction.

There are several interesting paths for future research. For example, it is important to know whether there are country differences in the drivers of payment attitude, intention and actual behaviour and thereby to what extent our findings apply to other countries. For example, in some cultures injunctive norms may play a more important role than in other cultures. Furthermore, we think it is important to further test our theoretical model by using an alternative measure of actual payment behaviour, for example payment diaries.

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Appendix A. Description of variables

Table A.1 Description of variables included in the baseline regressions (1/2)

Variable	Description	Mean	Sd	Min	Max	N
Attitude	The degree of agreement with the statement "Paying electronically is a good idea." minus the degree of agreement with the statement "Paying cash is a good idea.". Both statements are measured on a 1 (completely disagree) to 5 (completely agree) scale.	1.01	1.69	-4	4	2239
Intention	Payment intentions at POS in the next two weeks: in general (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.53	1.00	1	5	2232
Behaviour	Payment behaviour at POS in the past two weeks: in general (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.46	1.04	1	5	2036
Perceived attributes	For seven attributes (fast, safe, easy, cheap, budget, privacy, well-accepted) we take the perception (0=cash, 1=no difference, 2=electronic) and weigh it with its importance (1=absolutely not important, 2=not important, 3=neutral, 4=important, 5=very important). We sum these weighted perceptions and divide the outcome by 70. *Perceived attributes* ranges from 0 (respondents who find all attributes unimportant and/or belonging best to cash) to 1 (respondents who find all attributes very important and belonging best to electronic payment instruments).	0.46	0.22	0	1	2239
Injunctive norms	Norms (0 = respondents who think that all others prefer cash payments, 1 = respondents who in all cases strongly agree that they want to pay the way others want them to pay and that perceive that all others want them to pay electronically). It is based on eight "others": check-out operators (<EUR 10), check-out operators (≥EUR 10), catering staff (<EUR 10), catering staff (>=EUR 10), the government, own bank, storekeepers, and catering owners. For each case we construct a norm (0 = cash, 1 = others don't care, 2 = electronic) and weigh it by the self-reported motivation to comply (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The sum of all weighted norms is divided by 80 to get a variable that ranges between 0 and 1.	0.40	0.18	0	1	2186
Descriptive norms	Descriptive norms (0.04 = respondents who find the behaviour of all other not important at all and think that all others always pay cash. 1 = respondents who find the behaviour of all others very important and think that all others always pay electronically). It is based on the perceived payment behaviour of at most 5 "others" (partner, friends, family, colleagues, and other customers). For each case we construct a norm (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically) and weigh it by the extent to which one wants to resemble this behaviour (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The average of all weighted norms is divided by 25.	0.36	0.16	0.04	1	2186
Roles	Roles (1 = in all four roles always cash, 5 = in all four roles always electronically.). It is the average answer to four statements that measure respondents' perceptions of best-suited payment behaviour of someone (1) their age, (2) their income, (3) their lifestyle or (4) from their neighbourhood. The answers range from 1 (always cash) to 5 (always electronically).	3.49	0.75	1	5	2186
Personal norm	The degree of agreement with "It should always be possible to pay electronically." minus the degree of agreement with "It should always be possible to pay cash.". Both statements are measured on a 1 (completely disagree) to 5 (completely agree) scale.	0.29	1.64	-4	4	2186

Note: This table describes the variables used the regressions reported in Table 5. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions. POS=point-of-sale.

Table A.1 Description of variables included in the baseline regressions (2/2)

Variable	Description	Mean	Sd	Min	Max	N
Emotions	It is the average of six relative emotion measures: the degree of agreement with "Paying electronically feels [pleasant/safe/familiar/modern/valuable/simple]." minus the degree of agreement with "Paying cash feels [pleasant/safe/familiar/modern/valuable/simple].". All the underlying statements are measured on a 1 (completely disagree) to 5 (completely agree) scale.	0.85	1.50	-4	4	2186
Perceived control	The answer to "I think it is … possible to pay electronically." minus the answer to "I think it is … possible to pay cash.", which both range from 1 (never) to 5 (always).	-0.10	0.64	-4	4	2186
Habit	The average of three relative habit measures: (1) the degree of agreement with "I often pay electronically." minus the degree of agreement with "I often pay cash.", (2) the degree of agreement with "I have already been paying electronically for a long time." minus the degree of agreement with "I have already been paying cash for a long time.", and (3) the degree of agreement with "I pay electronically out of habit." minus the degree of agreement with "I pay cash out of habit.". All these underlying statements are measured on a 1 (completely disagree) to 5 (completely agree) scale.	0.72	1.74	-4	4	2036
Actual control electronic	Measures whether someone experienced a situation in which he/she wanted to pay electronically but could not do so (0 = yes, 1 = no).	0.97	0.17	0	1	2036
Actual control cash	Measures whether someone experienced a situation in which he/she wanted to pay cash but could not do so (0 = yes, 1 = no).	0.98	0.15	0	1	2036
Male	Binary dummy (1 = male, 0 = female).	0.53	0.50	0	1	2242
34 and below	Binary dummy (1 = 34 or below, 0 = else).	0.10	0.31	0	1	2242
Between 35 and 44	Binary dummy (1 = between 35 and 44, 0 = else).	0.17	0.38	0	1	2242
Between 45 and 54	Binary dummy (1 = between 45 and 54, 0 = else).	0.17	0.37	0	1	2242
Between 55 and 64	Binary dummy (1 = between 55 and 64, 0 = else).	0.21	0.41	0	1	2242
65 and over	Binary dummy (1 = 65 and over, 0 = else).	0.34	0.48	0	1	2242
Education	Successful completion of higher vocational education and/or university education. Binary dummy (1 = graduate level diploma, 0 = else).	0.37	0.48	0	1	2242
Income	Classification of gross monthly personal income in euros (1 = 500 or less, 2 = 501-1000, 3 = 1001-1500, 4 = 1501-2000, 5 = 2001-2500, 6 = 2501-3000, 7 = 3001-3500, 8 = 3501-4000, 9 = 4001-4500, 10 = 4501-5000, 11 = 5001-7500, 12 = 7500 or more).	4.95	2.79	1	12	2242
City	Degree of urbanisation of respondent's residence based on the address density (1 = not urbanised, 2 = little urbanised, 3 = moderately urbanised, 4 = strongly urbanised, 5 = very strongly urbanized).	2.95	1.30	1	5	2242
Responsible for finances	Binary dummy (1 = responsible for household's financial affairs, 0 = else).	0.66	0.47	0	1	2242
Week dummy	Binary dummy (1 = three weeks between the measurement of the payment intention and the measurement of actual payment behaviour, 0 = two weeks between the two surveys).	0.07	0.26	0	1	2036

Note: This table describes the variables used the regressions reported in Table 5. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Table A.2 Description of variables in robustness analyses (1/2)

Variable	Description	Mean	Sd	Min	Max	N
< EUR10 model						
Intention < EUR10	Payment intention in the next two weeks: amounts less than EUR 10 (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	2.97	1.25	1	5	2232
Behaviour < EUR10	Payment behaviour at POS in the past two weeks: amounts less than EUR 10 (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	2.93	1.24	1	5	2036
Injunctive norms < EUR 10	Norms (0 = respondents who think that all others prefer cash payments, 1 = respondents who in all cases strongly agree that they want to pay the way others want them to pay and that perceive that all others want them to pay electronically). It is based on six cases: check-out operators (<EUR 10), catering staff (<EUR 10), the government, one's own bank, storekeepers, and catering owners. For each case we construct a norm (0 = cash, 1 = others don't care, 2 = electronic) and weigh it by the self-reported motivation to comply (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The sum of all weighted norms is divided by 60 to get a variable that ranges between 0 and 1.	0.40	0.18	0	1	2186
⩾ EUR10 model						
Intention ⩾ EUR10	Payment intention in the next two weeks: amounts of at least EUR 10 (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.75	1.06	1	5	2232
Behaviour ⩾ EUR 10	Payment behaviour at POS in the past two weeks: amounts of at least EUR 10 (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.73	1.08	1	5	2036
Injunctive norms ⩾ EUR 10	Norms (0 = respondents who think that all others prefer cash payments, 1 = respondents who in all cases strongly agree that they want to pay the way others want them to pay and that perceive that all others want them to pay electronically). It is based on six cases: check-out operators (⩾EUR 10), catering staff (⩾EUR 10), the government, one's own bank, storekeepers, and catering owners. For each case we construct a norm (0 = cash, 1 = others don't care, 2 = electronic) and weigh it by the self-reported motivation to comply (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The sum of all weighted norms is divided by 60 to get a variable that ranges between 0 and 1.	0.43	0.19	0	1	2186
Supermarket model						
Intention supermarket	Payment intention in the next two weeks: supermarket (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.91	1.29	1	5	2204
Behaviour supermarket	Payment behaviour at POS in the past two weeks: supermarket (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.88	1.33	1	5	1955
Injunctive norms supermarket	Norms (0 = respondents who think that all others prefer cash payments, 1 = respondents who in all cases strongly agree that they want to pay the way others want them to pay and that perceive that all others want them to pay electronically). It is based on five cases: check-out operators (<EUR 10), check-out operators (⩾EUR 10), the government, one's own bank, and storekeepers. For each case we construct a norm (0 = cash, 1 = others don't care, 2 = electronic) and weigh it by the self-reported motivation to comply (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The sum of all weighted norms is divided by 50 to get a variable that ranges between 0 and 1.	0.45	0.19	0	1	2160

Note: This table describes the variables used in the robustness analyses reported in Table C.1, C.2, and C.3 in Appendix C. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions. POS=point-of-sale.

Table A.2 Description of variables in robustness analyses (2/2)

Variable	Description	Mean	Sd	Min	Max	N
Supermarket model						
Habit supermarket	Payment habit: groceries of EUR 23.75 (0 = cash, 1 = electronic payment instrument).	0.81	0.39	0	1	1955
Actual control supermarket	Measures whether one could always pay the way they wanted to pay during the past two weeks at the supermarket (0 = no, 1 = yes).	0.99	0.08	0	1	1955
Catering establishment model						
Intention catering	Payment intention in the next two weeks: catering establishment (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.43	1.28	1	5	1989
Behaviour catering	Payment behaviour at POS in the past two weeks: catering establishment (1 = always cash, 2 = mostly cash, 3 = as often cash as electronically, 4 = mostly electronically, 5 = always electronically).	3.23	1.36	1	5	1479
Injunctive norms catering	Norms (0 = respondents who think that all others prefer cash payments, 1 = respondents who in all cases strongly agree that they want to pay the way others want them to pay and that perceive that all others want them to pay electronically). It is based on five cases: catering staff (<EUR 10), catering staff (⩾EUR 10), the government, own bank, and catering establishment owners. For each case we construct a norm (0 = cash, 1 = others don't care, 2 = electronic) and weigh it by the self-reported motivation to comply (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree). The sum of all weighted norms is divided by 50 to get a variable that ranges between 0 and 1.	0.37	0.18	0	1	1958
Habit drinks	Payment habit: drinks of EUR 8 in a café (0 = cash, 1 = electronic payment instrument).	0.27	0.45	0	1	1480
Habit dinner	Payment habit: dinner of EUR 40 in a restaurant (0 = cash, 1 = electronic payment instrument).	0.84	0.37	0	1	1480
Actual control catering	Measures whether one could always pay the way one wanted to pay during the past two weeks in the catering establishment (0 = no, 1 = yes).	0.97	0.17	0	1	1480
Robustness exercises						
Habit 2	Average choice in nine situations (0 = cash in all situations, 1 = electronic payment mode in all situations).	0.60	0.26	0	1	2036
Perceived control 2	Relative perceived control. Average answer to "I expect to have my debit card or credit card with me.", "I expect that there will be a payment terminal. ", "I expect that there will be a failure, as a result of which I cannot pay electronically." (reversed scale), "I expect to remember my PIN code.", and "I expect to make payments that I want to keep private."(reversed scale) minus the average answer to "I expect that I will have enough cash on hand.", "I expect that there will be enough change.", and "I expect that cash will be accepted.". All underlying answers are measured on a 1 (certainly not) to 5 (certainly yes) scale.	0.05	0.97	-4	4	2187

Note: This table describes the variables used in the robustness analyses reported in Table C.1, C.2, and C.3 in Appendix C. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Appendix B. The importance of model elements

Table B.1 The importance of the socio-psychological factors for *intention*

		Attitude	*Roles*	*Injuncitve norms*	*Descriptive norms*	*Personal norm*	*Emotions*	*Perceived control*
Observations	2186	2186	2186	2186	2186	2186	2186	2186
R2/Pseudo R^2	0.02	0.24	0.24	0.04	0.05	0.12	0.29	0.03
Wald χ^2	96.06	1012.69	872.98	205.08	253.12	573.48	976.50	165.06
Model significance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Log-pseudolikelihood	-2760.89	-2142.45	-2130.54	-2697.83	-2668.57	-2466.27	-1995.09	-2721.24
AIC	5547.78	4312.89	4289.08	5423.67	5365.13	4960.53	4018.18	5470.47
Ranking		3	2	6	5	4	1	7

Note: This table reports the goodness of fit of models that include the control variables and the socio-psychological factor as indicated by the column name. The first column shows the goodness of fit of a model that only includes the control variables. AIC = Akaike's Information Criterion. The higher the ranking is, the higher the contribution of the particular factor in explaining payment intentions.

Table B.2 The importance of the socio-psychological factors for *behaviour*

		Intention	*Habit*	*Control*
Observations	2036	2036	2036	2036
R2/Pseudo R^2	0.01	0.34	0.32	0.02
Wald χ^2	83.59	936.86	903.26	101.68
Model significance	0.00	0.00	0.00	0.00
Log-pseudolikelihood	-2669.95	-1782.09	-1849.55	-2664.67
AIC	5367.90	3594.19	3729.10	5361.34
Ranking		1	2	3

Note: This table reports the goodness of fit of models that include the control variables and the socio-psychological factor as indicated by the column name. The first column shows the goodness of fit of a model that only includes the control variables. AIC = Akaike's Information Criterion. The higher the ranking is, the higher the contribution of the particular factor in explaining payment behaviour.

Table B.3 Comparison of our model with a basic model

	Basic model	*Our model*
Observations	2033	2033
R2/Pseudo R^2	0.18	0.39
Model significance	0.00	0.00
Log-likelihood	-2228.92	-1662.41
χ^2 Δ log-likelihood		1133.02***

Note: This table reports the goodness of fit of models that try to explain payment behaviour. The first column shows the goodness of fit of a model that only includes the control variables and perceived attributes. *** p<0.01.

Appendix C. Robustness

Table C.1 Transaction size models: regression results

	Transactions < EUR10			*Transactions ≥ EUR10*		
	Attitude	*Intentions < EUR10*	*Behaviour < EUR10*	*Attitude*	*Intentions ≥ EUR10*	*Behaviour ≥ EUR10*
Male	-0.06	0.41***	0.10	-0.06	0.22**	0.02
	(0.06)	(0.09)	(0.10)	(0.06)	(0.10)	(0.11)
34 and below	0.07	0.09	-0.12	0.07	0.02	-0.11
	(0.10)	(0.15)	(0.18)	(0.10)	(0.19)	(0.20)
Between 35 and 44	0.08	-0.48***	-0.43***	0.08	-0.21	-0.12
	(0.09)	(0.13)	(0.14)	(0.09)	(0.15)	(0.15)
Between 55 and 64	0.05	-0.80***	-0.23*	0.05	-0.18	-0.07
	(0.08)	(0.13)	(0.14)	(0.08)	(0.14)	(0.15)
65 and over	0.06	-1.28***	-0.40***	0.06	-0.34**	-0.20
	(0.08)	(0.12)	(0.13)	(0.08)	(0.14)	(0.14)
Education	0.15**	0.12	0.00	0.15**	0.13	0.26**
	(0.06)	(0.10)	(0.10)	(0.06)	(0.10)	(0.11)
Income	0.04***	-0.06***	-0.03	0.04***	-0.02	0.04**
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
City	0.01	0.02	-0.03	0.01	0.01	-0.01
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)
Responsible for finances	0.09	-0.02	0.06	0.09	0.03	0.06
	(0.06)	(0.09)	(0.10)	(0.06)	(0.10)	(0.11)
Perceived attributes	5.07***			5.07***		
	(0.13)			(0.13)		
Attitude		0.12*			0.31***	
		(0.06)			(0.06)	
Roles		0.92***			1.38***	
		(0.10)			(0.11)	
Injunctive norms < EUR 10 /		0.36			0.24	
Injunctive norms ⩾ EUR 10		(0.25)			(0.26)	
Descriptive norms		0.94***			1.02***	
		(0.31)			(0.35)	
Personal norm		0.03			0.01	
		(0.03)			(0.04)	
Emotions		0.78***			0.61***	
		(0.08)			(0.08)	
Perceived control		0.08			0.16**	
		(0.07)			(0.08)	
Intention < EUR10 /			1.53***			1.57***
Intention ⩾ EUR10			(0.08)			(0.09)
Habit			0.52***			0.56***
			(0.05)			(0.05)
Actual control electronic			0.36			-0.02
			(0.23)			(0.23)
Actual control cash			-0.43			-0.15
			(0.28)			(0.30)
Week dummy			0.14			-0.19
			(0.18)			(0.20)
Constant	-1.68***			-1.68***		
	(0.11)			(0.11)		
Observations	2239	2186	2036	2239	2186	2036
R^2/Pseudo R^2	0.47	0.24	0.34	0.47	0.30	0.34
F-statistic	163.50***			163.50***		
Wald χ^2		1090.97***	1132.92***		1079.01***	935.32***
Log pseudolikelihood		-8220.35			-7451.90	

Note: This table reports parameter estimates for two generalized structural equation models. Attitude is estimated with a linear regression and intentions and behaviour are estimated using ordered logit regressions. In total 2242 observations are included. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table C.2 Point-of-sale models: regression results

	Supermarket			*Catering establishment*		
	Attitude	*Intentions*	*Behaviour*	*Attitude*	*Intentions*	*Behaviour*
Male	-0.06	0.22**	-0.07	-0.06	-0.21**	-0.22*
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
34 and below	0.07	-0.19	-0.12	0.07	-0.27*	0.05
	(0.10)	(0.16)	(0.20)	(0.10)	(0.16)	(0.19)
Between 35 and 44	0.08	-0.01	-0.22	0.08	0.07	-0.23
	(0.09)	(0.15)	(0.17)	(0.09)	(0.14)	(0.17)
Between 55 and 64	0.05	-0.14	-0.21	0.05	0.08	-0.32**
	(0.08)	(0.14)	(0.16)	(0.08)	(0.13)	(0.16)
65 and over	0.06	-0.44***	-0.06	0.06	0.03	-0.16
	(0.08)	(0.13)	(0.15)	(0.08)	(0.13)	(0.14)
Education	0.15**	0.10	0.17	0.15**	-0.01	0.06
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
Income	0.04***	0.04*	0.06***	0.04***	-0.00	0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
City	0.01	0.04	0.01	0.01	0.03	0.08**
	(0.02)	(0.03)	(0.04)	(0.02)	(0.03)	(0.04)
Responsible for finances	0.09	0.04	-0.08	0.09	-0.11	-0.15
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
Perceived attributes	5.07***			5.07***		
	(0.13)			(0.13)		
Attitude		0.25***			0.08	
		(0.06)			(0.05)	
Roles		1.19***			0.81***	
		(0.10)			(0.09)	
Injunctive norms supermarket/		0.53**			1.30***	
Injunctive norms catering		(0.27)			(0.27)	
Descriptive norms		2.25***			0.72**	
		(0.36)			(0.31)	
Personal norm		0.01			0.05	
		(0.04)			(0.03)	
Emotions		0.53***			0.46***	
		(0.07)			(0.07)	
Perceived control		0.14*			0.20***	
		(0.08)			(0.08)	
Intention supermarket/			1.53***			0.99***
Intention catering			(0.09)			(0.07)
Habit			0.51***			0.23***
			(0.05)			(0.04)
Habit supermarket			0.94***			
			(0.20)			
Habit dinner						0.71***
						(0.16)
Habit drinks						1.00***
						(0.13)
Actual control supermarket/			-0.60			0.41
Actual control catering			(0.77)			(0.40)
Week dummy			-0.33			-0.35*
			(0.21)			(0.18)
Constant	-1.68***			-1.68***		
	(0.11)			(0.11)		
Observations	2239	2160	1955	2239	1958	1479
R^2/Pseudo R^2	0.47	0.26	0.40	0.47	0.16	0.24
F-statistic	163.50***			163.50***		
Wald χ^2		916.39***	896.61***		716.71***	772.43***
Log pseudolikelihood		-7448.05			-7947.04	

Note: This table reports parameter estimates for two generalized structural equation models. Attitude is estimated with a linear regression and intentions and behaviour are estimated using ordered logit regressions. In total 2242 observations are included. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table C.3 Models with alternative habit and perceived control measure

	Alternative habit measure			*Alternative perceived control measure*		
	Attitude	*Intentions*	*Behaviour*	*Attitude*	*Intentions*	*Behaviour*
Male	-0.06	0.26**	-0.03	-0.06	0.21**	-0.01
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
34 and below	0.07	0.10	-0.15	0.07	0.01	-0.11
	(0.10)	(0.20)	(0.22)	(0.10)	(0.20)	(0.22)
Between 35 and 44	0.08	-0.22	-0.02	0.08	-0.19	-0.18
	(0.09)	(0.16)	(0.16)	(0.09)	(0.16)	(0.16)
Between 55 and 64	0.05	-0.27*	0.00	0.05	-0.19	-0.15
	(0.08)	(0.15)	(0.16)	(0.08)	(0.15)	(0.15)
65 and over	0.06	-0.62***	-0.09	0.06	-0.53***	-0.31**
	(0.08)	(0.14)	(0.15)	(0.08)	(0.14)	(0.14)
Education	0.15**	0.24**	0.01	0.15**	0.19*	0.09
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
Income	0.04***	-0.04*	0.03	0.04***	-0.03*	0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
City	0.01	-0.00	-0.03	0.01	-0.01	-0.03
	(0.02)	(0.03)	(0.04)	(0.02)	(0.04)	(0.04)
Responsible for finances	0.09	0.07	0.02	0.09	0.10	-0.05
	(0.06)	(0.10)	(0.11)	(0.06)	(0.10)	(0.11)
Perceived attributes	5.07***			5.07***		
	(0.13)			(0.13)		
Attitude		0.23***			0.18***	
		(0.07)			(0.07)	
Roles		1.29***			1.19***	
		(0.11)			(0.12)	
Injunctive norms		0.37			0.39	
		(0.29)			(0.30)	
Descriptive norms		1.54***			1.75***	
		(0.35)			(0.37)	
Personal norm		0.02			-0.03	
		(0.04)			(0.04)	
Emotions		0.87***			0.79***	
		(0.09)			(0.09)	
Perceived control		0.15*				
		(0.08)				
Perceived control 2					0.65***	
					(0.07)	
Intention			1.74***			1.62***
			(0.10)			(0.10)
Habit						0.77***
						(0.06)
Habit 2			4.94***			
			(0.34)			
Actual control electronic			0.36			0.45*
			(0.27)			(0.26)
Actual control cash			-0.21			-0.03
			(0.32)			(0.28)
Week dummy			-0.12			
			(0.22)			
Constant	-1.68***			-1.68***		-0.13
	(0.11)			(0.11)		(0.21)
Observations	2239	2186	2036	2239	2187	2036
R^2/Pseudo R^2	0.47	0.34	0.39	0.47	0.36	0.39
F-statistic	163.50***			163.50***		
Wald χ^2		1152.91***	953.03***		1171.68***	950.48***
Log pseudolikelihood		-7149.29			-1663.88	

Note: This table reports parameter estimates for two generalized structural equation models. Attitude is estimated with a linear regression and intentions and behaviour are estimated using ordered logit regressions. In total 2242 observations are included. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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Postbus 98, 1000 AB Amsterdam
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