

Formatted Text Improves the Communication of Credit Card Information: Effects on Response Time

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Understanding basic credit card information can be important for maintaining secure personal finances. Although considerable human factors research has examined safety communications and warnings to avoid risk of personal injury, little human factors research has been conducted on communications associated with financial risk. This study explored whether human factors principles can be applied to credit card information intended for consumers. People's decision-making performance was examined with respect to credit card application information given in two formats: less versus more structured format, with the latter involving information chunking and spacing. Participants (N=40) compared 16 pairs of credit card applications with the task of selecting one among each pair that was the better financial deal (i.e., that reduced financial risk or saved more money). Eight pairs had less formatting (in prose style) and eight pairs had more structured formatting. The results showed that the credit card applications with the more structured format significantly reduced comparison (decision) times but had only minor effects on response accuracy. Implications for formatting financial risk disclosures are offered.

INTRODUCTION

The world's economies are attempting to emerge from a financial crisis which is partly due to consumers having accumulated substantial debt. Some of this debt is due to credit card policies and abuses by banks and consumers' overindulgences in purchasing goods and services using credit. Higher fees for credit and the poor use of credit have resulted in consumers paying higher interest rates and penalties.

Recently efforts are being made to examine ways to facilitate better-informed decisions by consumers regarding their finances. One problem appears to be consumers' low knowledge of basic information regarding finances. Lusardi and Tufano (2009) found that overall financial literacy is low and particularly so in older adults, women, people with lower income, and certain minority groups. Consumers have obtained more credit cards while card terms and conditions are becoming more complicated (Mishkin, 2007). Regulations are being revised to keep up with the growth in credit card use and to protect consumers from making ill-formed decisions regarding their credit.

There have been recent attempts to make headway towards improving credit card decision making. The Credit Card Accountability, Responsibility, and Disclosure Act (CARD) of 2009 was created to provide consumers with protection from accumulating excessive penalty fees (Federal Reserve System, 2010). The CARD Act mandates that credit card issuers notify cardholders 45 days before changing card holders' terms. Furthermore, under the CARD Act, people under the age of 21 cannot receive a credit card without the permission of a legal guardian or proof of intent to pay off the amount they owe. Card issuers must inform cardholders how long they will take to pay off balances while paying only monthly minimum payments.

The CARD Act is a step towards aiding consumers in making better decisions regarding credit, but it does not address the issue of people's lack of understanding of financial-related information and terms.

In 1968, the U.S. Congress passed the Truth in Lending Act (TILA) which mandates that lenders provide specific information to consumers regarding credit accounts (Federal Reserve System, 2010). TILA provides descriptions of credit card terms, and it describes the content of credit and charge card solicitation and application disclosures. The disclosures include the so-called Schumer Box, which contains a subset of credit card terms and conditions in a tabular form for the purpose of assisting consumers in finding important rate information (Mishkin, 2007). However, lenders are only required to display specific, limited information in the Schumer Box (Benton, 2009). Information found outside of the Schumer Box is typically given in smaller-print prose/paragraph format.

Gibson, Hall, and Harris (2009) proposed a disclosure format similar to the format of the standardized nutrition label used in the U.S. Durkin (2000) reported results describing several ways that people reported would make credit card forms better. Participants reported that information should clearly state the rates and rate changes, clearly define fees and charges, and make the "fine print" larger.

Despite there being suggestions on how to improve credit card applications, there have been very few published research studies concerning the topic. Macro International Inc. (2007), a consulting firm, conducted several studies examining ways to improve credit card forms. In one experiment, important information was placed both inside and outside of the Schumer Box. The firm found that participants tended to ignore information outside the Schumer Box. This finding suggests that consumers may miss certain information that is not in a structured, easy-to-use format. Indeed, previous research on the formatting of nutrition labels suggests that

consumers extract information faster from list-type formats than from a paragraph-type format (Wogalter, Shaver, & Chan, 2002).

Research on formatting other kinds of visual displays shows information presented in a list-type format is beneficial in reducing search time and increasing accuracy in information acquisition (Tullis, 1983). In the U.S., the structured format in food nutrition labels has been such a success that over-the-counter (OTC or nonprescription) drug labels are now standardized using a list-type format in most cases (FDA, 2005; FDA 2009; Mendat, Watson, Mayhorn, & Wogalter, 2005; Shaver & Wogalter, 2003).

The effort to communicate information in better ways is particularly notable in the area of safety warnings for which human factors/ergonomics (HFE) researchers have produced a knowledge base during the last 25 years. Well-designed safety communications and warnings are increasingly being used as a means to avoid personal injury, maintain health, and protect against property damage. Clearly, the use of warnings with regard to these aspects is important—but so is financial safety and security. Like consumer product and occupational safety, risk in terms of finances can affect people's well-being, prosperity, and security. Despite the inroads by HFE professionals to facilitate physical safety, HFE has provided little direct input in assisting the financial services sector to communicate monetary risks to consumers effectively. This link would likely benefit consumers so they can better understand and use the material presented. Potentially, the areas of information design and warnings could provide useful guidelines for producing better, more useable financial documents that communicate risk effectively. Heretofore, there has been little direct empirical research showing the utility of HFE principles in conveying financial risk information.

Thus, a main purpose of the present research was to use HFE principles with respect to formatting the information in a set of revised credit card disclosures. The study explores whether more structured formatting of financial information would increase the usability of credit card forms, specifically in terms of producing faster and better choices about credit card risks. Examined was whether more extensive formatting of credit card applications could aid consumers in making higher quality and quicker decisions. Participants compared pairs of nearly-identical credit card applications to determine which offered better rates and terms. In one condition the information had less formatting (paragraph/prose format) and the other had more formatting (outline/list format).

METHOD

Participants

Forty undergraduate students (23 males and 17 females, $M = 18.7$ years, $SD = 0.79$) from introductory psychology courses at North Carolina State University participated for research credit. The sample consisted of 75% Caucasian, 12.5% Asian, 7.5% African-American, and 5%

Hispanic/Latino. Participants were randomly assigned to one of two condition orders.

Materials

The credit card disclosures created for this study were based on content from actual credit card applications. Some were edited so that the entire contents fit on the front of a single page. The less-formatted and more-formatted application layouts were adapted from those found in Gibson et al. (2009). Figure 1 shows an example of a less-formatted disclosure. None of the disclosures in this format was identical; each disclosure varied in length and content. They were constructed using (a) Schumer Box formatting which contained a summary of credit card terms in list/outline format, followed by (b) an additional section of textual information that was in conventional paragraph/prose format with additional terms and conditions. Thus the less-formatted condition had some formatting, but also some text that was not formatted.

Credit Card 4a IMPORTANT TERMS AND CONDITIONS	
Annual Percentage Rate (APR) for Purchases	15.24% variable or 18.24% variable, depending on our review of your application and credit history
Other APRs	Balance Transfer APR: 0% fixed is effective for the first six billing cycles after the account is opened.* After that, 15.24% variable or 18.24% variable, depending on our review of your application and credit history. Cash Advances and Convenience Checks APR: 21.99% variable; Default APR: Up to 29.99% variable.†
Variable Rate Information	Your APR may vary. The rate is determined monthly by adding the Prime Rate and: * 11.99% or 14.99% for Purchases, and this rate will not be lower than 11.99% or 14.99% respectively. * 11.99% or 14.99% for Balance Transfers after the introductory period, and this rate will not be lower than 11.99% or 14.99% respectively. * 18.24% for Cash Advances and Convenience Checks, and this rate will not be lower than 18.24% or 29.99% for Default. See explanation below.**
Grace Period	At least 25-days Grace Period for Purchases from the Statement Closing Date on your periodic statement (provided you pay your previous balance in full by the due date). The Grace Period does not apply to Cash Advances, Balance Transfers or Convenience Checks.
Annual Fee	\$75 for Dividend Miles BusinessCard \$0 for No Fee BusinessCard
Minimum Finance Charge	\$1.00
Method of Computing the Balance for Purchases	Average Daily Balance (including new purchases)
BALANCE TRANSFER TRANSACTION CHARGE: During the first 6 billing cycles: 3% of the amount of each transfer, \$5 minimum, \$75 maximum. After the first 6 billing cycles: 3% of the amount of each transfer, \$5 minimum, \$75 maximum. CASH ADVANCE TRANSACTION CHARGE: 3% of the amount advanced, \$10 minimum, no maximum. CONVENIENCE CHECK CHARGE: 3% of the amount advanced, \$5 minimum, no maximum. LATE PAYMENT CHARGE: \$19 for balances < \$250; \$39 for balances >= \$250. OVER CREDIT LIMIT CHARGE: \$39 RETURNED PAYMENT AND CONVENIENCE CHECK CHARGE: \$39 INTERNATIONAL TRANSACTION CHARGE: 3% of the U.S. Dollar transaction amount each time you use your Card or Account to do a transaction with a business, other entity, or person in a currency other than U.S. Dollars. A FIXED APR means that the APR will not vary in concert with changes to an index, such as the U.S. Prime Rate. We reserve the right to change the APR as described in these terms and conditions after your account is opened, and in accordance with the Business Card Agreement, Delaware law and the Federal Truth in Lending Act.	
* INTRODUCTORY RATE NOTICE: If you do not timely pay at least the minimum due, your payment is not honored by your bank, or you exceed your credit line, the introductory APR will change to the Default APR as early as the first day of the billing cycle in which the default occurred.	
† DEFAULT APR: If your payment is received late, you fail to pay at least the minimum due, your payment is not honored by your bank, or your balance exceeds your credit card line, the APR on all balances (including any introductory balances) may be increased to the then applicable Default APR. The Default APR may go into effect on your Account (for all new and outstanding balances) as early as the first day of the billing cycle in which you defaulted. The applicable Default APR that will be applied to your account will be determined based upon our review of your credit history (including your credit performance with other creditors). The Default APR will increase or decrease with changes in the Prime Rate. If the APRs on your Account are increased to the Default APR, we may reduce the Default APR for all or selected balances on your Account at a later date.	
** CREDIT PERFORMANCE: After your Account is opened, we will periodically review your credit performance. If you do not maintain your credit performance with us, we may change your Account terms. *The Prime Rate used in determining the variable APRs on your account each billing cycle will be the highest rate published in the Money Rates column of The Wall Street Journal on either the first or last day of the billing cycle. The variable APRs, which are subject to a minimum APR, are current as of 5/24/09 using a Prime Rate of 3.25%.	
DISPUTE RESOLUTION: You agree that any dispute between us will be resolved by binding Arbitration.	

Figure 1. Example of disclosure with less-formatted layout.

In the less-formatted disclosures, the following credit card information categories appeared in the Schumer Box: APRs (e.g., purchases, balance transfer, cash advances, and default), variable rate information, grace period, annual fee, and method of computing balance for purchases. The following information categories appeared in the paragraph-formatted section: fees (e.g., foreign transaction, late payment, and cash advance) and additional information about card conditions (e.g., default APR triggers, dispute resolution). Most content was printed in 7-point font, except the variable purchases APR was printed in 8-point bold font. All content was printed in Arial (san serif) typeface.

Figure 2 shows an example of a more-formatted disclosure. Each of these had the same content as its associated (yoked) less-formatted disclosure. The more-

formatted disclosures were designed based on the guidelines used to construct food nutrition labels and on general HFE guidelines (e.g., Frascara, 2006) for typography and formatting (i.e., varied font sizes, sans-serif font type, all uppercase lettering for emphasis, bullet points, major categories, etc.). These disclosures contained short statements and sentences instead of long sentences and paragraphs. For example in the more-formatted disclosures, dispute resolution information was printed in bullet-point phrases, whereas the same information was printed in a paragraph in the less-formatted disclosures. In addition to including short statements, the more-formatted disclosures had each information category separated and displayed in sections (e.g., Rates, Fees, and Payment Options). These disclosures were printed in the same font size and typeface as used in the less-formatted disclosures, except the section headings were printed in 9-point bold font.

Credit Card 3a Facts	
Here is a summary of the terms of this credit card account	
Annual Percentage Rates (APR)	
Purchases	15.24% variable OR 18.24% variable *read "Variable Rates" for details
Balance Transfers	First 6 billing periods: 0% fixed After 6 billing periods: 15.24% variable OR 18.24% variable *read "Variable Rates" for details
Cash Advances	21.99% variable
Convenience Checks	21.99% variable
Default	After 1 late payment, payment made not at least the minimum due, payment is not honored by your bank, or balance exceeds credit card line, introductory rate may be revoked, and rate increased up to 29.99% variable *read "Variable Rates" for details
Variable Rates	APRs may vary, determined by credit and payment history Purchases and Balance Transfers APR: Prime Rate + 11.99%; 11.99% minimum OR Prime Rate + 14.99%; 14.99% minimum Cash Advance and Convenience Checks APR: Prime Rate + 18.74%; 19.99% minimum Default APR: up to 29.99%
Prime Rate	For each billing period we use the highest Prime Rate published in the Money Rates column in "The Wall Street Journal" on the first or last day of the billing period Current Prime Rate (as of 8/24/09): 3.25%
Fees	
Annual Fee	Dividend Miles BusinessCard: \$75 No Fee BusinessCard: \$0
Minimum Finance Charge	\$1.00
Foreign Purchases	3% of U.S. dollar amount per purchase
Balance Transfers	First 6 billing periods: 3% per balance transfer; \$5 minimum; \$75 maximum After 6 billing periods: 3% per balance transfer; \$5 minimum; no maximum
Late	\$10 on balances up to \$249 \$30 on balances over \$249
Cash Advances	3% per cash advance; \$10 minimum; no maximum
Convenience Checks	3% per cash advance; \$5 minimum; no maximum
Over-the-Credit-Limit	\$30
Returned Payment and Returned Convenience Check	\$30
Payment Options	
Grace Period	At least 20 days from Statement Closing Date if previous balance is paid in full by due date every due date, no interest due; grace period does not apply if total previous balance is not paid AND does not apply to Cash Advances, Balance Transfers or Convenience Checks
Minimum Balance by Due Date	Average Daily Balance: Calculated using day-to-day balance (including new purchases), finding daily balance average, and multiplying the average by an determined interest rate
Warnings	
Late Payments	Will affect your credit score; will increase your APR to Default APR as early as 1st day of billing period where late payment occurred
Changes to Credit Card Agreement	Rates, fees, and terms may change at any time and for any reason
Additional Terms and Conditions	
APR Increases	If payment is late, less than minimum due is paid, payment is NOT honored by your bank, or credit line exceeded, introductory APR will increase your APR to Default APR as early as 1st day of billing period where late payment occurred
Credit Performance	*We will periodically review your credit performance after your account is opened *If you do not maintain satisfactory credit performance, we may change your credit card terms
Dispute Resolution	*Any dispute between us will be resolved by binding arbitration *You will NOT have the right to have that claim resolved by a judge or jury and you will NOT have the right to participate in a class action in court or arbitration

Figure 2. Example of disclosure with more-formatted layout.

All disclosures were organized into two booklets that were printed on 28 x 43 cm (11 x 17 inch) paper. Each booklet contained eight pairs of disclosures (one disclosure pair per page). One booklet had only pairs of the less-formatted disclosures and the other had only pairs of the more-formatted disclosures. Disclosure pairs were positioned horizontally on each page. The disclosures on the left of each page was labeled "A" and the ones on the right was labeled "B." Disclosure "A" was the correct answer for four pairs and disclosure "B" was correct for the remaining four pairs. Within each disclosure pair, one of the following eight categories was modified to be different between the two paired disclosures: (1) balance transfer APR, (2) cash advance APR, (3) grace period, (4) minimum finance charge, (5) over

credit limit fee, (6) foreign transaction fee, (7) changes to agreement, and (8) calculating minimum balance. Each was modified with respect to quantitative amount. For example, one pair of disclosures differed on the duration of the grace period, with one stating it as 19 days and the other 25 days. The latter would be the correct choice for reduced financial risk.

Procedure

Participants were tested individually. Upon entering the laboratory, participants signed a consent form, and they completed a demographic questionnaire. Next, participants were given verbal instructions on the task that they were to perform. They were told to assume that they were looking for a credit card with the best conditions, such as lowest interest rates, lowest fees, and the least restrictive terms. They were told that they would be given one of two booklets containing 8 pages each containing pairs of credit card offer information and their task was to compare them to determine which was the better choice financially or would reduce financial risk. The two disclosures on each page were similar but differed according to an amount given in one of the information categories. One disclosure (either A or B) was better in terms of financial safety. They were asked to determine which was the better financial deal and to record which of the two disclosures was better (A or B) next to the numbered blanks on a response sheet. They were asked to record their answers as quickly and as accurately as possible, and to continue through their booklet until they finished all eight pairs in the order they appeared. Participants had a maximum of 4 minutes to complete the entire booklet.

Timing began when participants began examining a page of the booklet and was stopped when the participant responded by checking "A" or "B" on the corresponding answer sheet. The experimenter recorded the duration for participants to complete each page. Participants had a short rest break between booklets. In order to control for order effects, half of the participants viewed the booklet with the less-formatted disclosures first, and half viewed the booklet with the more-formatted disclosures first. Participants received different random orders of pairs within booklets. Later, participants were debriefed and thanked for their time.

RESULTS

The response time and accuracy data were analyzed in separate 2 (Format: less versus more formatted) X 8 (Information Category) repeated-measure analyses of variance (ANOVAs). Mean response times and proportion accuracy (per disclosure pair) for the two formats are shown in Table 1.

Response Time

The ANOVA showed a significant main effect of format, $F(1, 39) = 8.08$, $MSe = 6922.04$, $p = .007$ and information category, $F(7, 273) = 23.44$, $MSe = 1875.63$, $p <$

Table 1. Mean response times (seconds) and proportion mean accuracy as a function of less- and more-formatted disclosure layout and information category for booklets with 8 disclosure pairs.

Information Category									
Structured Format	Balance Transfer APR	Cash Advance APR	Grace Period	Minimum Finance Charge	Over Credit Limit Fee	Foreign Transaction Fee	Changes to Agreement	Calculating Minimum Balance	Mean
LESS									
time (s)	90.4	80.4	73.2	54.1	83.7	111.3	146.3	137.8	97.1
accuracy	.90	.75	.93	.98	.95	.75	.53	.83	.83
MORE									
time (s)	80.6	68.9	74.3	63.2	68.6	64.9	107.3	99.8	78.5
accuracy	.88	.75	1.00	1.00	.58	.88	.73	.90	.84
MEAN									
time (s)	85.5	74.6	73.8	58.6	76.1	88.1	126.8	118.8	87.8
accuracy	.89	.75	.96	.99	.76	.81	.63	.86	.84

Note: Credit card categories are in order as they appeared in less-formatted disclosures. Values in boldface represent proportion mean accuracy.

.001. The more-formatted layout ($M = 78.45$) produced significantly faster comparison times than the less-formatted ($M = 97.14$). The means for the different information categories are shown in the *bottom* row of Table 1. Comparisons among these means using Tukey's HSD test (at $p < .05$) indicated that Changes to Agreement and Calculation of Minimum Balance took significantly longer time than the other items but did not differ between each other. No other comparison was significant.

ANOVA also showed a significant Format X Information Category interaction, $F(7, 273) = 5.07$, $MSe = 1614.96$, $p < .001$. These means are shown in the cells *within* Table 1. The simple effects analysis showed that the more-formatted layout produced significantly different response times from the less-formatted layout for the following information categories: (a) Foreign Transaction Fee, $F(1, 39) = 20.43$, $MSe = 2107.64$, $p < .001$; (b) Calculating Minimum Balance, $F(1, 39) = 8.40$, $MSe = 3451.70$, $p = .006$; and (c) Changes to Credit Agreement, $F(1, 39) = 13.54$, $MSe = 2243.32$, $p = .001$. The response times for these categories were faster in more-formatted disclosures.

Accuracy

The ANOVA showed a significant main effect of information category, $F(7, 273) = 7.56$, $MSe = .15$, $p < .001$, but no significant main effect for format, $F(1, 39) < 1.0$. The disclosure items means are presented on the *bottom* row of Table 1. In general, participants chose correctly the item of the pair that was financially better. The two highest were Minimum Finance Charge ($M = .99$) and Grace Period ($M = .96$). The two lowest were Changes to Agreement ($M = .63$) and Cash Advance APR ($M = .75$). According to Tukey's HSD test, the two lowest were also significantly lower than Balance Transfer APR ($M = .89$) and Calculating Minimum Balance ($M = .86$).

The ANOVA also showed a significant Format X Information Category interaction, $F(7, 273) = 7.32$, $MSe = .08$, $p < .001$. These means are shown in the cells of Table 1. Simple effects analysis showed a significant difference between the two formats for the following information categories: (a) Over Credit Limit Fee, $F(1, 39) = 19.29$, $MSe = .15$, $p < .001$, and (b) Changes to Credit Card Agreement, $F(1, 39) = 9.75$, $MSe = .08$, $p = .003$. Accuracy was higher in the more-formatted version for Changes to Agreement compared to the less-formatted version, but the reverse was found for Over Credit Limit Fee.

DISCUSSION

Overall, the results showed significantly faster response times in the more-formatted disclosures than in the less-formatted disclosures. Both formats had approximately the same information content, but one had more of the content formatted than the other. The greater extent of formatting helps in more quickly finding and comparing information in credit card disclosures. The more-formatted version had less print density (greater white space). The results are consistent with other research showing that text printed in higher print density (i.e., reduced "white" space) increases search time (e.g., Goldberg, Probart, & Zak, 1999; Tullis, 1983).

The most prominent time differences were the reduced time to search information in the more formatted version that appeared as unformatted paragraph/prose text in the less-formatted version (information outside of the Schumer Box). There were no significant differences in accuracy between the two formats. Most of the differences were in the time measure. There are several possible reasons why there were only a few small differences in accuracy between conditions. One is that accuracy was relatively high for both disclosure formats and there might have been a ceiling effect for some items. A ceiling effect could have

limited the ability to find an improvement because accuracy was relatively high across conditions. Another reason for not finding effects using the accuracy measure is that once participants found the section of the disclosure that differed, it was relatively easy to choose between the two. The speed difference between the two formats appears to be due to a difference in being able to find the information category that differed in the pair. Once found, participants accurately decided which of the pair is the better deal. It also indicates that participants understood which quantitative direction of items is less risky financially. The third reason that accuracy was not different between conditions is that both conditions provided the same information. If the information had been manipulated (such as increasing or decreasing its clarity), then accuracy differences might have been easier to show.

One of the categories, Changes to Credit Card Agreement, produced significantly more accurate responses with the more-formatted version compared to the less-formatted version. A possible reason is that this information category was embedded in the middle of a paragraph of the less-formatted version; however, in the more-formatted version, it was appeared in lower density print as a single line separated from other information categories. This accuracy improvement gives some credence for having information presented in a structured format rather than in the conventional paragraph/prose format.

However, another category, Over Credit Limit Fee, produced a result that was in the opposite direction: significantly higher accuracy with the less formatted version than the more-formatted version. Location and most of the wording were similar in both formats, but the less formatted version had the heading in all upper case letters whereas the more formatted version used mixed case. Letter case or something else could have caused this difference or simply due to sampling error. Additional investigation is needed for a more conclusive determination.

Over time changes will likely be made to credit card disclosures. Some modifications have been made (Benton, 2009; Federal Reserve System, 2009), including some changes to font size, use of bold font, and placement of credit card terms and conditions (Federal Reserve System, 2009). Card issuers are now required to print change-in-term conditions and to list penalty, late, and exceeding credit limit fees inside of the Schumer box. Some of these changes were made by Macro International, Inc.; however, most recommended changes have not been verified by consumer performance data. Performance data was collected in the present study and differences that were found depended on the extent of text formatting. The present research supports the efforts toward increasing formatting in credit card disclosures.

Future research should verify the findings with participants reflecting more diverse demographics (age, socioeconomic, etc.) than were used the present study, which was composed of college students.

Also in the future, we hope that HFE professionals will provide more empirical research data to the domains of financial risk disclosures. This research shows that improvements can be made by structuring the information to

better enable high quality decisions. HFE professionals could use their knowledge of designing effective safety communications and warnings to produce more understandable credit card applications and other financial risk documents. The effects of formatting have shown success in this and other research. The findings here could be useful in suggesting redesigns of other kinds of disclosures to aid in consumer's management of risk.

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