

MEMORANDUM

June 18, 1998

TO: Blanca Bayo, Director, Division of Records and Reporting

FROM: Dan Hoppe, Director, Division of Research and Regulatory Review *DMA*

SUBJECT: Special Project No. 980000A-SP - Fair and Reasonable Residential Basic Local Telecommunications Rates

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The attached copies are journal articles and studies pertaining to affordability which were referenced at the June 17th affordability workshop. Please include them in the files for Project 980000A-SP so they may be accessed by all interested persons.

An itemized list of the journal articles and studies includes:

Burg, Annemarie. "Telephone Affordability Study of Selected Wyoming Residents," Wyoming Public Service Commission.

Appendix D--OPASTCO Subscriber Survey Description, Keeping Rural America Connected: Costs and Rates in the Competitive Era.

Hancock, K. E., "'Can Pay? Won't Pay?' or Economic Principles of 'Affordability'," *Urban Studies*, Vol. 30, No. 1, 1993, pp. 127-145.

ACK \_\_\_\_\_ Notani, Arti Sahni, "Perceptions of affordability: Their role in predicting purchase intent and purchase," *Journal of Economic Psychology* 18, 1997, pp. 525-546.

APP \_\_\_\_\_ Thank you.

CAF \_\_\_\_\_

CMU \_\_\_\_\_

CTR \_\_\_\_\_ DMH:WBM:tfm-hopp98

EAG \_\_\_\_\_ cc: Mary Andrews Bane  
Division of Communications

LEG \_\_\_\_\_ Division of Auditing and Financial Analysis

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# Telephone Affordability Study of Selected Wyoming Residents

By  
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Wyoming Public Service Commission

## Introduction

The Wyoming Public Service Commission (Commission) is the state agency responsible for administering the Wyoming Telecommunications Act of 1995. Among other things, this Act mandates cost-based pricing for local telephone service but also states that: "It is the intent of this Act to provide a transition from rate of return regulation of a monopolistic telecommunications industry to competitive markets and to maintain affordable essential telecommunications services through the transition period."<sup>1</sup>

This study was developed to provide Wyoming policymakers with a better understanding of the concept of affordability from the perspective of average Wyoming residents considering their local telephone service. The findings provide the Wyoming Public Service Commission and others with information that may assist them in the formulation of policies implementing the Wyoming Telecommunications Act of 1995 and in ensuring compliance with the Federal Telecommunications Act of 1996, both of which mandate competition for local telephone service while maintaining affordable prices.

A direct mail survey was chosen as the best method to collect the necessary information to determine affordability for the average Wyoming resident primarily. Existing prices and the recent U S WEST hearings conducted by the Wyoming Public Service Commission further illustrated the value of the proposed mail survey because affordability issues presently enjoy some prominence in the minds of consumers. The survey was limited to ten to twelve questions to make it as easy

as possible for the recipient to answer and return, in turn increasing the response rate.

This study was developed to provide Wyoming policymakers with a better understanding of the concept of affordability from the perspective of average Wyoming residents considering their local telephone service.

## Background

### Wyoming Public Service Commission

The Commission must educate customers, resolve complaints, and ensure that the residents of Wyoming have access to safe and reliable utility services. Under the Wyoming Telecommunications Act of 1995, the Commission is charged with overseeing the transition from rate of return regulation to the competitive provision of local exchange services. Its duty is to see to it that the change is as transparent as possible and that the benefits of competition are passed on to the state's residents.<sup>2</sup>

### Wyoming Telecommunications Act of 1995

In 1995, the Wyoming Legislature adopted the Wyoming Telecommunications Act of 1995 (W. S. 37-15-101 through 37-15-501). The Act mandates the local telecommunications industry in Wyoming to make a transition from a monopolistic to a more competitive paradigm. The intent of this legislation, when fully implemented, is to provide customers the benefits of competition, including ultimately prices moderated by competition and enhanced choice, not only in who provides local telephone service, but also in the manner in which that service is provided (e.g., land line vs. wireless service, local dial tone only vs. local service pack-

<sup>1</sup>Wyoming Telecommunications Act of 1995, 1995, 37-15-102, Legislative intent.

<sup>2</sup>See: <http://psc.state.wy.us/strategicplan.html>.

aged with other optional or long distance services). The Legislature's concern in adopting this legislation, as evidenced in the Act itself, is that local telephone service remain affordable to all Wyoming ratepayers.

By enacting this legislation, Wyoming went directly to the forefront of national telecommunications policy initiatives. As an example, in 1996, fully one year after the passage of the Wyoming Act, Congress enacted the federal Telecommunications Act of 1996 which contained many requirements similar to those in the Wyoming Act, including a call for vastly relaxed regulation of local telephone service. Both of these pieces of legislation required that, during this change, telephone rates must remain affordable. As discussed in the FCC's Report and Order regarding universal service released on May 8, 1997, the determination of affordability includes not only subscribership levels, but also nonrate factors such as local calling area, income level, population density, and the cost of living and other nonprice based measures of affordability.<sup>3</sup>

Local exchange services, pursuant to Wyoming law, now must be priced so that the amount of revenue recovered from the sale of each service recovers the cost of providing that service, as measured by the service's total service long-run incremental cost (TSLRIC). The Wyoming Act states that: "No telecommunications company shall use revenues earned from or allocate expenses to non-competitive services to subsidize services determined by the commission to be subject to competition."<sup>4</sup>

In order to make the transition to competition less burdensome to ratepayers and to mitigate the possibility that some extremely high cost customers would drop their service altogether, the Legislature

<sup>3</sup>Federal Communication Commission Joint Board Report and Order, Released: May 8, 1997. CC Docket No. 96-45, paragraph 109.

<sup>4</sup>Wyoming Telecommunications Act of 1995, 1995. 37-15-403 (a), Cross - subsidies prohibited; enforcement.

adopted provisions allowing for the establishment of a Universal Service Fund as part of the Act. This fund's purpose is to "... assist only those customers of telecommunications companies located in areas of this state with relatively high rates for essential services."<sup>5</sup> A monthly charge applied to telephone service subscribers will create the fund, and it will be distributed to the companies which provide service to customers at rates that "exceed 130 percent of the weighted statewide average local exchange rate."<sup>6</sup> The fund enables local exchange service to remain affordable for customers who live in remote or otherwise high cost areas by keeping their basic monthly telephone charges down.

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#### Survey

According to 1990 census data,<sup>7</sup> there are approximately 169,000 households in the State of Wyoming. While the use of statistical methods in determining the appropriate sample size for the survey was contemplated, it was concluded that a statistically valid sample size, determined by way of accepted sampling techniques, was well beyond the scope of this study. At the same time, it was also recognized that the use of an inadequate sample size would not be representative of the larger body of Wyoming ratepayers, particularly in light of the fact that the average response rate for mail

<sup>5</sup>Wyoming Telecommunications Act of 1995, 1995. 37-15-501 (c), Universal service fund created; contributions; administration.

<sup>6</sup>Wyoming Telecommunications Act of 1995, 1995. 37-15-501 (d), Universal service fund created; contributions; administration.

<sup>7</sup>See: <http://yenus.census.gov/cdrom/lookup/864408116>.

surveys is 25 percent.<sup>8</sup> Conversely, the use of a supra adequate sample size would have had serious implications for the budget established for the project. Ultimately, it was determined that a sample size of one thousand Wyoming residents would be within the budget and would provide a sufficient number of responses to provide meaningful results.

The sample was obtained by requesting a mailing list from a company headquartered in Florida, with the only stipulation being that the addresses provided be located somewhere in Wyoming. Most addresses were residential, but there is the possibility some business addresses were included. The survey questionnaires and envelopes were addressed to "Wyoming Resident" in order to avoid the possibility of new occupants of a household returning the survey unopened and therefore increasing the undeliverable rate.

When the mailing list was received, the addresses were divided into three regions based on the following criteria:

- the first three digits in the zip code,
- the cities covered by the Cheyenne area telephone book, and
- the number of addresses from each city that were included in the mailing list.

The three regions are large enough that a sufficient number of responses could be expected to be returned from each region and the results would not be skewed due to small numbers. The regions and the number of surveys sent to each region are as follows:

- Region 1: Casper and Douglas (319).

- Region 2: Cody, Greybull, Lander, Lovell, Powell, Riverton, Thermopolis, and Worland (283).
- Region 3: Cheyenne, Laramie, Rawlins, Torrington, and Wheatland (394).

The first two questions reflect an effort to determine the subscribership level of the sample. If the respondent did not have telephone service, Question 2 was aimed at finding out why. Question 3 made it possible to break the returned surveys into regions. The next question determined whether the available telephone service gave the customer access to essential services. Questions 5-8 dealt with income and the amount people would be willing to pay for local telephone service before it would not be an affordable service. The next three questions were posed to determine how important local telephone service is to customers and if there are any substitutes. Question 12 let the respondents make any comments which they thought would be beneficial to the Commission.<sup>9</sup>

### Background Findings

Even though telephone<sup>10</sup> are commonplace in many households, there are some households without local telephone service. According to some studies on such households, which were conducted between 1993 and 1995, the primary reasons people do not have telephone service include:

- they had telephone service in the past, but incurred excessive toll charges,
- they feared others would use the service and charge it to them, and

<sup>8</sup>McCarthy, Jerome E. and William D. Perreault Jr. *Basic Marketing* (Irwin, Homewood, IL: 1987).

<sup>9</sup>For a copy of the questions, please see Appendix B available at [http://psc.state.wy.us/telco/afford/afford\\_1.html](http://psc.state.wy.us/telco/afford/afford_1.html).

- they feared they would purchase items by telephone.<sup>10</sup>

Another reason that people gave for not having telephone service was that the installation fees and deposits are excessive.<sup>11</sup>

The Federal Communications Commission, in adopting revised rules governing the administration of the federal Universal Service Fund pursuant to the Federal Act, recognized that income plays an important part in the affordability of local telephone service. A recent article justifies this importance. According to the article, when the cost of basic telephone service is around 1 percent of the household income, subscribership levels are at or above 90 percent. When the cost drops below 0.7 percent of the income, the subscribership increases to 99 percent.<sup>12</sup>

The federal government has several programs in place that help to keep telephone service affordable. The primary mechanism for the distribution of federal support in aid of local telephone service is the federal Universal Service Fund (USF). At the time of the drafting of this report, all the rules and policies required to implement the revised federal USF were still being developed by the FCC with prospective implementation in 1998.

LinkUp America is a federally sponsored program that assists people in connecting to the local telephone network. LinkUp America allows a \$35.00 discount for installation of local service to qualified applicants. The funds for this program come from the federal Universal Service Fund.

Lifeline is also a program sponsored jointly by the federal government and participating state govern-

ments (about ten states do not participate). The program provides a discount on the monthly basic telephone service charge of up to \$7.00, \$3.50 is supplied from the federal Universal Service Fund and the other \$3.50 comes from the state where the applicant resides.<sup>13</sup> In Wyoming, participation is voluntary for all local service providers except US WEST.

### Results<sup>14</sup>

Of the 996 surveys sent out, 58 were undeliverable by the post office. A total of 353 were returned completed giving a response rate of 37.6 percent. Region 3 topped the three regions with 148 returned surveys. Region 1 had 106, while Region 2 had 91 completed surveys. Eight surveys were included in the statewide figures, but were excluded from any one region because Question 3 was left blank or did not have a city listed and so could not be classified.

Most of the people responding have telephone service. In fact, 99 percent of those who returned the survey have local telephone service. This varied between 100 percent in Region 1 and 98 percent in Region 2, with Region 3 reporting 99 percent. The two answers given most often for not having telephone service were that the installation fees/deposits were too high and the bills the customer incurred were too large. The only other reason given for not subscribing to local telephone service was that there was not an office for the local telephone company in Cheyenne where the customer could get problems resolved.

Statewide, 97 percent of the households polled do not receive a long distance charge when they call hospitals, schools, and other essential services. Region 2 again had the lowest result with 92 percent not receiving a toll charge. Region 1 and 3 both had 99 percent who stated that they were

<sup>10</sup>See: <http://www.ctr.columbia.edu/vi/papers/cacm.htm>.

<sup>11</sup>See: <http://www.ctr.columbia.edu/vi/papers/1996usf.htm>.

<sup>12</sup>See: <http://www.benton.org/Library/Recommend/Affordability.htm>.

<sup>13</sup>Wyoming Statutes implementing this program are found at W. S. 37-2-301 through 37-2-306.

<sup>14</sup>For the numbers and percentages refer to Appendix C available at the previously mentioned web site.

able to reach these essential services without charge.

Based on income levels, the most frequent response to the question of what the level of monthly charge would be at which people would no longer subscribe to local telephone service is "other," implying something greater than \$40.00 per month. The only income level which was an exception was the \$0-15,000 level which gave \$30.00 per month as their top response. Forty dollars was the second most marked response for households both the upper income levels (greater than \$30,000) and the lowest income level (less than \$15,000). The \$15,001-30,000 level's second most common answer was \$30.00 (see Graph 1).

Not based on income, the largest percentage of households questioned (36 percent) marked "other" again, implying that a price of more than \$40.00 would be the highest acceptable basic monthly charge above which customers statewide would no longer wish to subscribe to local telephone service. Following "other" was \$40.00 (20 percent) and then \$30.00 (18 percent) for the highest acceptable monthly charge. Region 3 followed the pattern of the statewide results of "other" (36 percent), \$40.00 (21 percent) and \$30.00 (20 percent). Region 1 followed the pattern with "other" (46 percent) and \$40.00 (21 percent) being the first two choices, but the third choice was \$35.00 (20 percent). "Other" (27 percent) was the first choice for Region 2 with \$30.00 (25 percent) being second. \$40.00 and \$25.00 tied for third each with 16 percent. The charges and corresponding percentages are compared for each region and statewide in Table 1.

Of those questioned who budget for monthly expenses, 47 percent of the respondents in Region 1 set aside 1 percent or less for local telephone service. In Region 2, 54 percent of the respondents allocate 2-5 percent of their budget for this service, as do 47 percent in Region 3, and 44 percent overall. Statewide, 85 percent, or 179 out of 215 people who responded to question six (concerning what percentage they budget for local telephone service), apportion 5 percent or less of their monthly budget for this purpose.

Considering what the consumers said they currently pay for local telephone service, the difference between that amount and the level at which they would no longer subscribe was calculated. The "other" responses were not included, nor were current charges above \$40.00. Statewide, the most popular answer (with sixty responses) shows that customers are willing to pay an additional increment of \$5 to \$10 per month for telephone service. Following closely behind (with fifty-six responses) was the indication that customers would be willing to pay up to an additional \$5.00 per month for telephone service (see Graph 2). Region 2 and Region 3 had the same order for the first two responses. In Region 1, up to an additional \$5 per month was the most popular response, followed by the \$5 to \$10 increment.

Local telephone service is "very important" according to the responses to Question 9. Statewide, 83 percent thought so, while only 2 percent believed that telephone service was "not important." A total of 100 percent of the returned surveys in Region 1 rated local service as either "very important" (84 percent) or "somewhat important" (16 percent). In Region 2, 1 percent thought that local service was not important, 13 percent thought it somewhat important, and 86 percent believed it to be very important. In Region 3, only 79 percent rated local telephone service as very important. A total of 18 percent thought it to be somewhat important and 3 percent found it not important.

Based on income levels, the most frequent response to the question of what the level of monthly charge would be at which people would no longer subscribe to local telephone service is "other," implying something greater than \$40.00 per month.

The sampled Wyoming residents rated the importance of local telephone service, cable television, Internet service, household transportation, and entertainment/recreation on a one to five scale with five being the highest or most important. The answers were pooled and summed using a weighted score. Overall local telephone service and household transportation were rated as the

### Top Charge on Local Phone Service Comparison of Income Levels-Statewide

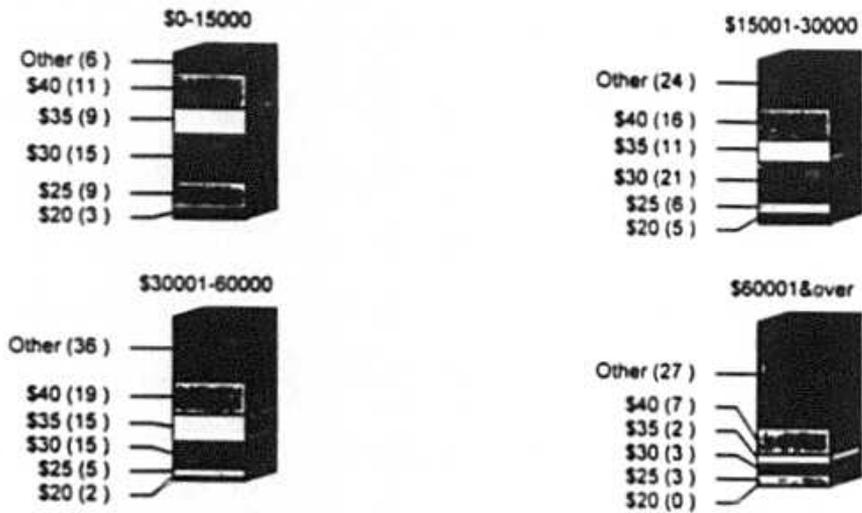


TABLE 1  
REGIONAL AND STATEWIDE CHARGES

	<u>Region 1</u>	<u>Region 2</u>	<u>Region 3</u>	<u>Statewide</u>
\$20	0 percent	5 percent	4 percent	4 percent
\$25	5 percent	16 percent	5 percent	9 percent
\$30	8 percent	25 percent	21 percent	18 percent
\$35	19 percent	10 percent	14 percent	14 percent
\$40	22 percent	16 percent	21 percent	20 percent
Other	46 percent	27 percent	35 percent	36 percent

most important, nearly tying on a percentage basis (23.20 percent and 22.97 percent, respectively). Rounding the answers out were cable television (19.19 percent), entertainment/recreation (19.07 percent) and Internet service (15.57 percent). The results are basically the same when the regions are viewed separately. In Region 1, telephone service was first in importance with 23.59 percent of the responses, followed by transportation (22.14 percent), cable TV and entertainment/recreation (19.31 percent), and the Internet (15.66 percent). In Regions 2 and 3, transportation was most important with 23.14 percent and 23.48 percent of the responses, respectively. Local telephone service followed with 22.60 percent and 23.24 percent, respectively. Rounding out Region 2 was entertainment/recreation (18.83 percent), cable TV (18.22 percent), and the Internet (17.22 percent). Region 3 ended with cable TV (19.66 percent), entertainment/recreation (19.18 percent), and Internet service (14.44 percent).

Cellular telephone service, electronic mail, and the Internet service are not viewed as alternatives to local telephone service according to 64 percent of those surveyed statewide. However, 36 percent responded that one, two or three of these technological options could be used as an alternative. In Region 1, the results were much closer, 58 percent said they were not an alternative, while 42 percent believe they were a possible option. Region 2 was split with one-third (33 percent) responding that

they could be an option and two-thirds (67 percent) saying none of the three was an optional surrogate for local telephone service. A total 68 percent of the people responding in Region 3 said they were not an option while 32 percent said they were an option.

Overall local telephone service and household transportation were rated as the most important ...

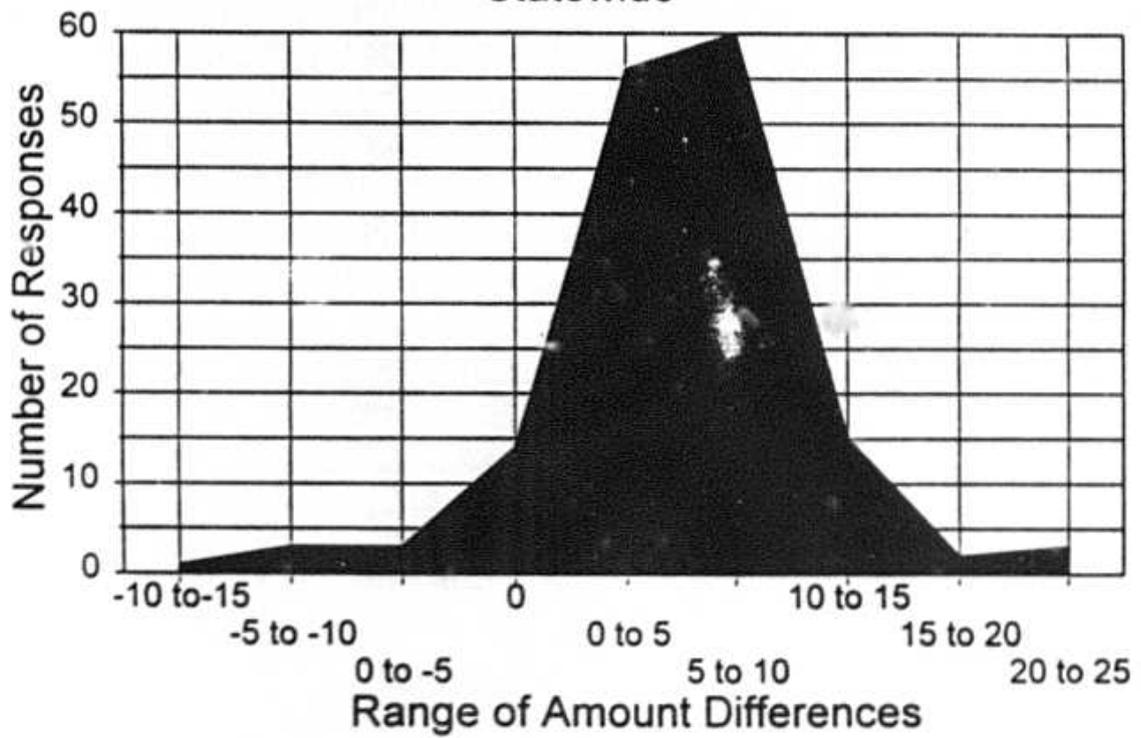
#### Analysis

The study's response rate of 37.6 percent was more than 10 percent better than the average for such studies, which could be an indicator that Wyoming citizens are concerned with the affordability of their local telephone service. Many citizens also voiced their opinion on Question 12, a request for additional comments, which shows their concern about this issue.

Subscriber rates in Wyoming are high based on the earlier described responses. This may be an indication that the telephone rates as they stand currently are affordable.

Most households do not incur toll charges when they call essential services such as hospitals and schools. From this information, one may conclude that, in most of the polled areas, the calling area is

### Difference Between Now & Top Charge Statewide



sufficient as discussed by the Federal Communication Commission in its Report and Order on universal service released May 8, 1997, although it may not be ideally sized for all business transactions that customers would like to make from their homes on a regular basis. Greybull and Douglas furnish interesting examples. Of the six surveys returned from Greybull, four respondents said that they could not contact essential services without incurring a charge. Douglas, on the other hand, responded they could call essential services; but in the comment section, some citizens expressed their wish to be able to call to Casper without a long distance charge being incurred.

Local telephone service is considered by many Wyoming residents to be essential. They view it as a service they cannot live without, and they consequently do not want to see prices rise too high. A substantial portion of those who marked "other" as their option on the question regarding the monthly rate at which they would no longer subscribe to local telephone service described their need for the service as being so great that they would pay almost any amount, but they did not want the Commission to conclude that rates should therefore be allowed to increase dramatically. Some respondents included long distance charges in the current amount they reported for their local monthly telephone service charges and, therefore, stated that their monthly charge was anywhere from \$40 to \$100. Therefore believed rates could go higher than \$40.

The second and third most common responses to the question about the highest rate the customer would be willing to pay prior to considering disconnection were \$40 and \$30 per month, which are both higher than most current monthly basic charges. Also, as indicated by the amount that subscribers pay now and the amount that would cause them to disconnect their service, telephone rates apparently have a "cushion" of up to \$10. It appears, therefore, that there is some room for upward movement in the monthly local telephone service charge. That is, the survey indicates that monthly prices could be increased, if required to comply with the Wyoming Telecommunications

Act of 1995, and still maintain affordable rates and high subscribership levels.

The importance of an item directly relates to affordability and a customer's willingness to pay increased prices. The more important an item, is the more people would be willing to spend to have it. Based on the households questioned and their responses, people place local telephone service among their top priorities (with the question having excluded food and lodging). Although four of the five items compared in Question 10 were ranked closely, household transportation and local telephone service were the top choices. This leads to the conclusion that people would be more willing to spend their money on these items first; and then, if there were any money left over, they would purchase from the other categories.

Another factor that relates generally to affordability is availability of substitutes. A person will not pay as much for an item if there is another item that can be used in its place, as long as the replacement item fulfills the intended purpose as well or better than the original or is priced at a substantial discount where the price savings makes up for inferior quality. Currently there is no available and acceptable alternative to local telephone service, according to a majority of those questioned. However, about one-third of those polled view new technologies, such as electronic mail, the Internet and cellular telephone service, either as substitutes now or as soon-to-be substitutes for local telephone service. This third may be willing to switch if local telephone service prices increased to a level at which the alternatives were more cost effective.

Local telephone service is considered by many Wyoming residents to be essential. They view it as a service they cannot live without, and they consequently do not want to see prices rise too high.

### Conclusion

The Wyoming Telecommunications Act of 1995 requires that local telephone service in Wyoming

become a competitive industry with cost-based pricing. This study was conducted to examine affordability and how it relates to the local telephone service industry. Its purpose is to better inform the Wyoming Public Service Commission and other interested parties and to assist them in the implementation of the cost-based pricing mandated in the 1995 Act.

Affordability is an important focus in the federal Telecommunications Act of 1996 and further discussed in the FCC's Report and Order regarding universal service released on May 8, 1997, which the Commission must also consider because of their effect on prices for local telephone service. The Report and Order included subscribership levels and the local calling area in their list of determinants for affordability. Wyoming subscribership levels are high; and, from the responses gathered from the survey, it appears that they should remain high.

Wyoming is predominately rural. Cities are few and far between, which means that local calling areas are limited in size. They do allow people to reach local essential services, such as hospitals and schools, which is the basic requirement of a calling area. Therefore, from the standpoint of calling areas, Wyoming's local telephone rates are currently affordable. Because there is no pending action to shrink calling areas, this perspective of affordability is not likely to change.

Local landline telephone service is very important to the residents of Wyoming. Customers see no comparable substitute for it at this time which seems to indicate that the subscribership levels will remain the same unless the rates go above the \$30.00 range. If they do, some people indicate that they will disconnect their telephone service because the benefits of having it do not outweigh the cost to keep it active.

Finally, concerns were expressed about how the elderly and those living on fixed incomes would be able to afford increases in local telephone service if cost-based pricing mandates increases. It is necessary for people in these groups to have local telephone service in case of medical or other emergen-

cies. The telephone also keeps some elderly persons connected to the outside world. To resolve this situation, previously discussed programs, such as Lifeline and LinkUp America, can help to maintain affordable rates for these residents. Therefore, persons with this concern need to find out if they qualify for assistance and can do so by contacting their local telephone company or the Wyoming Department of Family Services.

Annemarie Burg is currently completing her senior year of undergraduate study at the University of Wyoming where her major is Small Business Management.

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Journal of Economic Psychology 18 (1997) 525-546

JOURNAL OF  
**Economic  
Psychology**

## Perceptions of affordability: Their role in predicting purchase intent and purchase

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Received 15 November 1995

### Abstract

While consumer researchers have found that attitudes and purchase intentions are important predictors of purchase, they have neglected the role of affordability concerns that should be equally important. We examined the role of perceptions of affordability in predicting purchase intent and actual purchase. We found that (1) perceptions of affordability improve the prediction of purchase intent over and above that provided by attitude and subjective norms. Also, affordability perceptions are not mediated by attitude, but rather have a direct influence on purchase intention; (2) affordability perceptions also improve prediction of purchase over and above that provided by purchase intent, but only when consumers perceive the product to be relatively expensive. In addition, the effect of affordability perceptions on actual purchase is not mediated by purchase intent when the product is viewed as relatively expensive, but completely mediated by purchase intent when the product is viewed as more easily affordable; (3) perceptions of affordability mediate the attitude-intention, subjective norm-intention, and purchase intention-purchase relationships. © 1997 Elsevier Science B.V.

*PsycINFO classification:* 3900; 3920; 3940

*JEL classification:* M31; M3; M1; M2

*Keywords:* Affordability; Monetary resources; Financial constraints; Attitudes and purchase

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## 1. Introduction

Consumers commonly desire to own products that they cannot afford to buy. While the impact of affordability on consumers' purchase decisions has aroused considerable interest among marketing practitioners (e.g., Hancock, 1993; Scrafin and Johnson, 1995; Wernle, 1995), this issue has received little attention among consumer researchers. Economic theory recognizes that consumers, when attempting to maximize utility, are limited by their budgets. However, consumer researchers, like psychologists, have tried to predict behavior based solely on preference, neglecting the cost or sacrifice element that entails almost every behavior (Brock, 1968; Meyer, 1982).

In spite of its roots in economics, marketing does not share the economist's holistic view of consumption. A reason for this is that over time marketing, especially consumer behavior, has aligned itself more closely with psychology (Leong, 1989; Mittelstaedt, 1990). This has occurred because the objectives of marketing had more in common with objectives of psychology than that of economics, i.e., explanation and prediction of individual behavior (Mittelstaedt, 1990). Microeconomics focuses on aggregates such as price levels, total production and consumption (MacFayden, 1986). On the other hand, psychology is concerned with the explanation and prediction of individual behavior. The differences in the disciplines notwithstanding, greater insight into behavior of consumers can be gained by integrating psychological and economic aspects (van Raaij, 1981; Verhallen and Pieters, 1984; Warneryd, 1988). This approach was pioneered by Katona (1951, 1975, 1980) who argued that in addition to ability to buy (discretionary income), the willingness to buy (consumer expectations, confidence, and sentiment) is an important determinant of consumer expenditure. He examined various psychological variables in addition to economic variables to predict economic phenomena. Katona's argument can be summarized as follows: economic changes are a function of consumer sentiment rather than economic variables alone, and there are intervening variables between economic stimuli and economic responses. Similarly, we believe that purchase is a function not only of attitudes and purchase intentions but of economic considerations as well.

Purchase prediction has often been examined fruitfully within the framework provided by a popular social psychological theory, the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975). Briefly, the TRA posits that the best predictor of behavior is behavioral intention. In turn, behavioral intention is predicted by attitude toward the behavior and subjective norms. There is reason to believe that in the marketing context, where the focus is

on predicting purchase to consumers. The assumption behavior and perceptions of may have a very impact but this may not be true. Further, a positive same reasons. In the literature.

The purpose of this research in this area is to understand its role within the conditions such as: Can we predict above that available attitudes/subjective norms intention? Does it predict behavior better than between affordability purchase? What is purchase intent as important in predict

## 2. Background

Income is an important factor both as an exogenous variable postulated to affect interest rates and as a policy, e.g., in total expenditure, savings formation on family income. Total family income and provide explicit measure of a person's less "essential" expenditure measure, it has a

hey cannot afford to purchase decisions ctioners (e.g., Han- his issue has received ic theory recognizes are limited by their ogists, have tried to the cost or sacrifice 3; Mayer, 1982). hares the economist's over time marketing, isely with psychology ause the objectives of chology than that of ial behavior (Mittel- ch as price levels, to- On the other hand, diction of individual iding, greater insight ig psychological and rs, 1984; Warneryd, 1975, 1980) who ar- ome), the willingness ent) is an important rious psychological onomic phenomena. omic changes are a variables alone, and uli and economic re- not only of attitudes s as well. lly within the frame- , the Theory of Rea- , the TRA posits that ) turn, behavioral ind subjective norms. t, where the focus is

on predicting purchase, affordability concerns should also be of great concern to consumers. Thus, a more realistic and complete representation of consumption behavior requires that both attitudes, preferences, motivations, and perceptions of economic realities be considered. For example, a parent may have a very positive attitude toward buying his or her child a bicycle but this may not translate into positive intent for lack of financial resources. Further, a positive intent to do so may not translate into purchase for the same reasons. In this study, we address this gap within the consumer behavior literature.

The purpose of this study is to empirically examine the role of affordability perceptions in predicting purchase intent and purchase. Given the scarcity of research in this area, this study is best seen as exploratory in nature. As a first step in understanding the role played by affordability perceptions, we examine its role within the context of the TRA variables. We seek answers to questions such as: Can perceptions of affordability provide information over and above that available from attitude? What is the relationship between attitudes/subjective norms and affordability perceptions in influencing purchase intention? Does including a measure of affordability perceptions predict behavior better than predicted by intention alone? What is the relationship between affordability perceptions and purchase intention in influencing actual purchase? What is the process by which affordability perceptions influence purchase intent and actual purchase? When are affordability perceptions important in predicting purchase?

## 2. Background

Income is an important variable in economics and is examined extensively, both as an exogenous and an endogenous variable. Changes in income are postulated to affect consumer spending and saving, which prompt changes in interest rates and other economic policies. Similarly, changes in economic policy, e.g. in taxation rates, affect consumer incomes, which in turn affect expenditure, saving, and the like. Marketing researchers regularly collect information on family income as part of demographic profiles of households. Total family income (TFI) is used to segment markets, profile consumers, and provides explanations for changes in purchasing patterns. A better measure of a person's ability to buy is discretionary income which is total income less "essential" expenditures. However, in spite of the obvious merit of such a measure, it has not been used much. Reasons range from the inability of

consumers to report their discretionary income precisely (Ferber, 1962), to the subjective nature of what is essential and what is not (Katona, 1975, 1980). Additionally, easy availability of credit has liberated consumers from depending upon cash income, and, instead, made spending dependent upon what they psychologically feel capable of spending (Tobin, 1972).

While the role of perceptions of affordability in individual product choice has received little attention in consumer research, there is some evidence for the importance of consumers' evaluation of their financial situation in predicting consumer expenditure at a more aggregate level. Researchers tested Katona's basic premise and found that consumer expenditure, saving and credit are affected by the consumers' evaluation of their household financial situation; in many cases these subjective evaluations perform better than a measure of real disposable income (e.g., Curtin, 1982; Praet and Vuchelen, 1984; Williams and Defris, 1981), or a measure of consumers' evaluation of the general economic condition of the nation (e.g., van Raaij and Gianotten, 1990).

In this study, we examine how perceptions of whether one perceives that he/she can afford the product or not influence purchase intent and actual purchase. Affordability perceptions are a psychological manifestation of an economic variable. Measuring whether a person feels psychologically capable of spending circumvents the problems inherent in objective measures of income mentioned above. Further, due to easy access to credit cards and other forms of credit, such perceptions may in fact be a more realistic measure of how much one can actually afford to spend. While affordability concerns should be important in determining purchase, they may not be important for all types of purchases. For inexpensive, repeat purchase products like paper towels, candy, and the like, affordability concerns are not important in determining purchase since it is easy to bear the cost of such products. Simply intending to buy them should be sufficient to lead to their purchase. Thus, it would appear that the role of affordability concerns in predicting purchase is more important for products that are perceived more as expensive by consumers. Further, solely having the ability to purchase an item does not lead to purchase. For purchase to take place, a person has to intend to buy the product and have the ability to buy it. Similarly, purchase intentions should be stronger if, in addition to liking the product, a person believed that he/she could afford to buy the product. On the other hand, if a person liked the product, but could not afford to buy it, he/she would not have strong intentions to buy it. However, purchase intentions (compared to actual purchase) are a purely internal, psychological phenomenon. Simply possessing the abi-

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### 3. Methodology

#### 3.1. Sample and procedure

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#### 3.2. Questionnaire

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*A.S. Notuni / Journal of Economic Psychology 18 (1997) 525-546*

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lity to afford a product should motivate one to buy it, regardless of whether the product is perceived as expensive or inexpensive by the consumer. Further, it would be expected that people intend to buy a product because they like it, or significant others would want them to buy it and that they can afford to buy it.

### 3. Methodology

#### 3.1. Sample and procedure

To identify product categories for the study, a pilot study consisting of informal interviews was conducted with undergraduate students. The students were asked to supply a range of events and activities associated with these events that they would normally engage in the coming months. To obtain different levels of spending, subjects were also asked to supply the amount in dollars corresponding to each activity in each event category. On the basis of these interviews, 'buying a gift/dinner for someone for Valentine's day' and 'celebrating completion of mid-term exams by going out to dinner, a sporting event, or a rock concert' scenarios were chosen for the study. The students indicated that they would spend between \$25 and \$50 for the former event and between \$10 and \$25 for the latter event.

The study was described as a survey being conducted by the University to determine students' spending habits and activities engaged in by them. Respondents were a different set of students enrolled in an undergraduate class during the winter term. Data were collected at two time periods. At time 1, the students indicated their attitude, subjective norm, affordability perceptions, and purchase intention for both scenarios. The total number of responses obtained was 157. At time 2 - two weeks later - behavioral self-reports were solicited for the mid-term celebration and Valentine's gift scenarios. At time 2, 116 (73.9%) students responded to both the scenarios. The respondents were given class participation credit.

#### 3.2. Questionnaire

Actual dollar ranges obtained from the pilot study were mentioned in the measures. For example, intention for the Valentine scenario read "I intend to buy dinner/a present (in the range \$25-\$50) as a Valentine's day gift." For the celebration scenario it read, "I intend to celebrate the completion of

mid-term exams by going out to dinner, a sporting event, or a rock concert, where I might spend \$10-\$25."

All the constructs were measured on 7-point scales. Attitudes were measured by seven items: pleasant/unpleasant, boring/interesting, good/bad, unfavorable/favorable, enjoyable/unenjoyable, useful/useless, harmful/harmless. The alpha coefficients for the scenarios were 0.93 (Valentine) and 0.91 (celebration).

Subjective norms were measured in a global fashion. Normative beliefs and motivations to comply were assessed non-contiguously in the questionnaire with respect to "most people who are important to me." Consistent with the TRA, normative beliefs were combined with motivations to comply to obtain a measure of subjective norms.

Affordability perceptions were measured by three items: "If I want to, I could easily afford"; "For me to spend"; and "My personal income permits me to easily spend." For the Valentine's day scenario, the items continued as "in the range of \$25-\$50 on buying dinner/a present as a Valentine's day gift." For the mid-term exam scenario, each item continued as "\$10-\$25 on celebrating the completion of mid-term exams by going out to dinner, a sporting event, or a rock concert." The 7-point scales were anchored by "extremely likely/extremely unlikely", "easy/difficult", and "strongly agree/strongly disagree" respectively. The first two items were adapted from Ajzen and Madden (1986); the third item was created to tap into the affordability and income aspect more directly. An exploratory factor analysis resulted in a single factor solution for both the scenarios. The alpha coefficients for the scenarios were 0.86 (Valentine) and 0.80 (celebration).

Purchase intentions were measured by three items for each scenario: "I intend to", "I will try to", and "I will make an effort to". The first item was anchored by "definitely do/definitely do not"; the second and third items by "definitely will/definitely will not". The alpha coefficients were 0.97 (Valentine) and 0.95 (celebration).

Behavior self-reports (taken at time 2) were coded as 1 if the respondent reported performance of the behavior and 0 if she/he reported the behavior was not performed.

#### 4. Results

Results are given first for the Valentine's gift scenario and then for the celebration scenario. The data were analyzed by means of hierarchical regres-

sion. For the prediction of the first step (model 1) resulting in  $F^*ATT$  and  $AFF^*S$  dichotomous variables, regression. INT as the dependent variable (model 1). In the second step, the interaction term (model 2) resulting in model

#### 4.1. Valentine's gift

##### 4.1.1. Predicting purchase

The results pertaining to the prediction of purchase are shown in Table 1. It was hypothesized that the explained variance by the first model (model 1) would be significant ( $\beta = 0.437, p < 0.01$ ). As expected, the interaction term was significant ( $\beta = 0.287, p < 0.01$ ). The  $F$ -test for model 2 is significant ( $F(1, 153) = 20.00, p < 0.01$ ). The  $R^2_{adj}$  is 0.48. The interaction term is significant ( $F(2, 153) = 10.00, p < 0.01$ ).

These results show that the explained variance is significant.

Table 1  
Predicting intention: Valentine's gift

Variables	M1*
	std. $\beta$
ATT	0.437***
SN	0.324***
AFF	-
AFF*ATT	-
AFF*SN	-
$R^2_{adj}$	0.49

\*M1 = model 1, M2 = model 2

1 323-346

A.S. Hatani / Journal of Economic Psychology 18 (1997) 323-346

331

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Attitudes were measured as good/bad, useless, harmful/harmless, routine) and 0.91 (cele-

n. Normative beliefs usually in the questionnaire to me." Consistent motivations to comply

items: "If I want to, I can afford it." Personal income permits the purchase of items continued as "I can afford it as a Valentine's day gift." The item continued as "\$10-\$25 worth of going out to dinner, a gift." Items are anchored by "extremely strongly agree/strongly disagree" adapted from Ajzen (1991) into the affordability analysis. The analysis resulted in alpha coefficients for each item (alpha).

each scenario: "I intend to purchase it." The first item was 0.97 and the second and third items were 0.97 (Val-

1 if the respondent reported the behavior

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sion. For the prediction of purchase intention, ATT and SN were entered in the first step (model 1). In the second step, AFF was added to the predictors in model 1 resulting in model 2. In the third step, the interaction terms of AFF\*ATT and AFF\*SN were entered resulting in model 3. Since behavior is a dichotomous variable, the behavioral data were analyzed by means of logistic regression. INT as the sole predictor of behavior was entered in the first step (model 1). In the second step, AFF was added resulting in model 2. In the third step, the interaction term AFF\*INT was entered in predictors of model 2 resulting in model 3.

#### 4.1. Valentine's gift scenario

##### 4.1.1. Predicting purchase intentions

The results pertaining to the prediction of purchase intention are given in Table 1. It was hypothesized that affordability perceptions would add explained variance beyond that provided by attitude and subjective norms in predicting purchase intention. As can be seen from model 1, ATT ( $\beta = 0.437, p < 0.01$ ) and SN ( $\beta = 0.324, p < 0.01$ ) resulted in an  $R^2_{adj}$  of 0.39. As expected, the inclusion of AFF resulted in a significant coefficient ( $\beta = 0.287, p < 0.01$ ) and increased the  $R^2_{adj}$  to 0.46. The variance explained by model 2 is significantly greater than that explained by model 1 ( $F(1, 153) = 20.00, p < 0.01$ ). Further, the inclusion of AFF\*ATT ( $\beta = 0.582, p < 0.05$ ) and AFF\*SN ( $\beta = -0.459, p < 0.10$ ) terms raised the  $R^2_{adj}$  to 0.48. This increase in variance explained by model 3 over model 2 is significant ( $F(2, 151) = 3.33, p < 0.05$ ).

These results show that the inclusion of affordability perceptions increases variance explained in intention over and above that explained by attitude and

Table 1  
Predicting intention: Valentine's day gift scenario

Variables	M1*		M2		M3	
	std. $\beta$	b	std. $\beta$	b	std. $\beta$	b
ATT	0.437***	0.308	0.389***	0.274	0.117	0.082
SN	0.324***	0.172	0.254***	0.135	0.620**	0.329
AFF	-	-	0.287***	0.354	-0.010	-0.012
AFF*ATT	-	-	-	-	0.582**	0.014
AFF*SN	-	-	-	-	-0.459*	-0.012
$R^2_{adj}$	0.39		0.46		0.48	

\*M1 = model 1, M2 = model 2, M3 = model 3. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

subjective norms alone. In addition, the variance explained in purchase intentions is further improved when persons simultaneously possess: (1) a favorable attitude and the ability to afford the product, (2) strong pressure to comply with expectations of significant others and the ability to afford the product.

To examine the AFF\*ATT and AFF\*SN interactions, we present the regression equation and the estimates from model 3 as Eq. (1):

$$\text{INT} = 0.493 + 0.082 \text{ ATT} + 0.329 \text{ SN} - 0.012 \text{ AFF} + 0.014 \text{ AFF*ATT} - 0.012 \text{ AFF*SN}. \quad (1)$$

To examine the nature of these interactions further, the regression analog of simple main effects analysis in traditional ANOVA was conducted. This involves calculating the unstandardized *b* coefficient of ATT/SN on INT for "low" (1 SD below), "average" and "high" (1 SD above) levels of AFF (Cohen and Cohen, 1983; Jaccard et al., 1990).<sup>2</sup> The equation for calculating the slope of the predicted effects of attitude on intention at any particular value of affordability perceptions is obtained by differentiating Eq. (1) with respect to ATT and SN:

$$\frac{\delta \text{INT}}{\delta \text{ATT}} = \beta_1(\text{at AFF}) = 0.082 + 0.014 \text{ AFF}, \quad (2)$$

$$\frac{\delta \text{INT}}{\delta \text{SN}} = \beta_2(\text{at AFF}) = 0.329 - 0.012 \text{ AFF}. \quad (3)$$

Level of AFF	$\delta \text{INT}/\delta \text{ATT}$	<i>t</i> -value	$\delta \text{INT}/\delta \text{SN}$	<i>t</i> -value
Low	0.212	4.71***	0.218	3.96***
Average	0.286	6.36***	0.154	4.81***
High	0.360	4.41***	0.091	2.84***

\*\*\* *p* < 0.01.

These results show that as affordability perceptions become stronger, a unit increase in attitude results in greater impact on intention; or, the impact of attitude on purchase intentions is stronger at higher levels of affordability.

<sup>2</sup> *b* value obtained by substituting low, average and high values of AFF into Eq. (2). For equation  $Y = \alpha + \beta_1 \text{ ATT} + \beta_2 \text{ SN} + \beta_3 \text{ AFF} + \beta_4 \text{ AFF*ATT} + \beta_5 \text{ AFF*SN} + \epsilon$ ,  $t = (\beta_1 \text{ at AFF}) / \text{std. error } (\beta_1 \text{ at AFF})$ , where,  $\text{std. error } (\beta_1 \text{ at AFF}) = \{(\text{var}(\beta_1) + \text{AFF}^2 \text{ var}(\beta_4) + 2 \text{ cov}(\beta_1, \beta_4))^{1/2}\}$ .

On the other hand, ability perceptions get increasingly less important as respondents could a people's opinion.

Given that afford and above that price. What is the process? Would a lack which in turn will be a positive attitude to buy it for lack of effect of affordability perceptions have an effect. To address these questions (Kenny, 1986).

FF  
(independent variable)

To demonstrate mediation that:

1. The independent variable has a significant effect on the dependent variable in regression 2.
2. The independent variable has no significant effect on the dependent variable in regression 3.
3. The mediator variable in regression 2 is significant.

The results for regression 2 show that AFF significantly affects INT (0.581, *p* < 0.01). In regression 3, AFF does not significantly affect INT (0.424, *p* < 0.01) is

subjective norms alone. In addition, the variance explained in purchase intentions is further improved when persons simultaneously possess: (1) a favorable attitude and the ability to afford the product, (2) strong pressure to comply with expectations of significant others and the ability to afford the product.

To examine the AFF\*ATT and AFF\*SN interactions, we present the regression equation and the estimates from model 3 as Eq. (1):

$$\text{INT} = 0.493 + 0.082 \text{ ATT} + 0.329 \text{ SN} - 0.012 \text{ AFF} \\ + 0.014 \text{ AFF*ATT} - 0.012 \text{ AFF*SN}. \quad (1)$$

To examine the nature of these interactions further, the regression analog of simple main effects analysis in traditional ANOVA was conducted. This involves calculating the unstandardized *b* coefficient of ATT/SN on INT for "low" (1 SD below), "average" and "high" (1 SD above) levels of AFF (Cohen and Cohen, 1983; Jaccard et al., 1990).<sup>2</sup> The equation for calculating the slope of the predicted effects of attitude on intention at any particular value of affordability perceptions is obtained by differentiating Eq. (1) with respect to ATT and SN:

$$\frac{\delta \text{INT}}{\delta \text{ATT}} = \beta_1(\text{at AFF}) = 0.082 + 0.014 \text{ AFF}, \quad (2)$$

$$\frac{\delta \text{INT}}{\delta \text{SN}} = \beta_2(\text{at AFF}) = 0.329 - 0.012 \text{ AFF}. \quad (3)$$

Level of AFF	$\delta \text{INT}/\delta \text{ATT}$	<i>t</i> -value	$\delta \text{INT}/\delta \text{SN}$	<i>t</i> -value
Low	0.212	4.71***	0.218	3.96***
Average	0.286	6.36***	0.154	4.81***
High	0.360	4.41***	0.091	2.84***

\*\*\*  $p < 0.01$ .

These results show that as affordability perceptions become stronger, a unit increase in attitude results in greater impact on intention; or, the impact of attitude on purchase intentions is stronger at higher levels of affordability.

<sup>2</sup>  $\beta$  value obtained by substituting low, average and high values of AFF into Eq. (2). For equation  $Y = \alpha + \beta_1 \text{ ATT} + \beta_2 \text{ SN} + \beta_3 \text{ AFF} + \beta_4 \text{ AFF*ATT} + \beta_5 \text{ AFF*SN} + \epsilon$ ,  $t = (\beta_1 \text{ at AFF}) / \text{std. error } (\beta_1 \text{ at AFF})$ , where,  $\text{std. error } (\beta_1 \text{ at AFF}) = \{(\text{var}(\beta_1) + \text{AFF}^2 \text{ var}(\beta_4) + 2 \text{ cov}(\beta_1, \beta_4))\}^{1/2}$ .

On the other hand, ability perceptions get increasingly less important as respondents could afford the product in their own people's opinion.

Given that affordability and above that pressure to buy it for lack of effect of affordability perceptions have an effect on purchase intentions. To address these questions, see Kenny (1986).

AFF  
(independent variable)

To demonstrate mediate effect that:

1. The independent variable has a significant effect on the dependent variable.
2. The independent variable has a significant effect on the mediator variable in regression 2.
3. The mediator variable has a significant effect on the dependent variable in regression 3.

The results for our study show that AFF significantly affects purchase intentions (0.581,  $p < 0.01$ ). It also affects purchase intentions (0.424,  $p < 0.01$ ) is

525-546

A.S. Notani / Journal of Economic Psychology 18 (1997) 525-546

533

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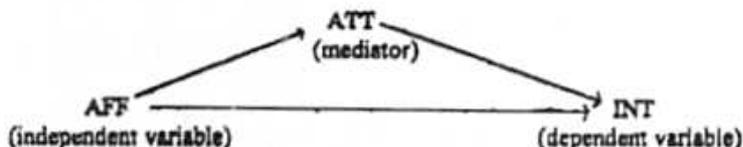
3.96\*\*\*  
4.81\*\*\*  
2.84\*\*\*

As affordability perceptions get stronger, a unit  
increase in subjective norms; or, the impact of  
subjective norms on intention is reduced as a function of affordability.

into Eq. (2). For equation  
the standard error of the  
estimate is  $(\sigma^2)^{1/2}$ .

On the other hand, the results for the AFF\*SN term show that as affordability perceptions get stronger, a unit increase in subjective norms results in increasingly less impact on intention. This implies that the more the respondents could afford to buy the product, the less weight they put on other people's opinion.

Given that affordability perceptions can explain variation in intention over and above that provided by attitude, one question still needs to be addressed: What is the process by which affordability perceptions impact purchase intention? Would a lack of financial resources result in a lesser positive attitude, which in turn will lead to poor purchase intentions or, could a person have a positive attitude toward buying a product while at the same time not intend to buy it for lack of financial resources? That is, does attitude mediate the effect of affordability perceptions on purchase intention or do affordability perceptions have an effect on purchase intention that is independent of attitude? To address these questions, a mediation analysis was conducted (Baron and Kenny, 1986).



To demonstrate mediation, we need to conduct three regressions and demonstrate that:

1. The independent variable (AFF) influences the mediator (ATT).
2. The independent variable (AFF) influences the dependent variable (INT).
3. The mediator influences the dependent variable. The impact of the independent variable on the dependent variable must be less compared to that in regression 2. Perfect mediation is demonstrated when the independent variable has no effect when the mediator is controlled for. Note that we are testing the mediating role of attitude and not that of affordability perceptions since as per the TRA there is no theoretical rationale for the latter.

The results for our mediation analysis are given in Table 2. These results show that AFF significantly affects both ATT (0.449,  $p < 0.01$ ) and INT (0.581,  $p < 0.01$ ). In addition, the size of the regression coefficient for AFF (0.424,  $p < 0.01$ ) is reduced a bit when the effect of ATT is controlled for.

Table 2

Testing for attitude as a mediator of the affordability perceptions-purchase intent relationship: Valentine's day gift scenario

Condition	Regression equation
1	AFF (0.449 <sup>***</sup> ) influences ATT
2	AFF (0.581 <sup>***</sup> ) influences INT
3	ATT (0.333 <sup>***</sup> ) influences INT and marginally decreases the influence of AFF (0.424 <sup>***</sup> ) on INT

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

The  $\beta$  coefficient drops from 0.581 in the second regression equation to 0.424 in the third equation. This implies that attitude only marginally mediates the effect of affordability perceptions on purchase intent, and that affordability perceptions have a direct and independent influence on purchase intent.

#### 4.1.2. Predicting actual purchase

Of the 115 subjects available at time 2, 72 (62.6%) reported going out to dinner or having bought a present for someone. The results pertaining to the prediction of purchase are given in Table 3. In logit analysis, the significance of a set of  $k$  independent variables is determined by a likelihood-ratio (LR) test. The LR test is the counterpart of the  $F$ -test in analysis of variance or regression analysis. This involves computing an LR statistic as follows. First, the model is estimated by constraining and not constraining the impact of the set of  $k$  independent variables to zero. Then, corresponding log-likelihood (LL) values denoted as  $L_1$  and  $L_2$ , the LR statistic is computed as  $2(L_2 - L_1)$ . This statistic is  $\chi^2$  distributed with  $k$  degrees of freedom. It was ex-

Table 3

Predicting behavior: Valentine's day gift scenario

Variables	M1	M2	M3
INT	0.236 <sup>***</sup>	0.205 <sup>***</sup>	-0.083
AFF	-	0.099*	-0.128
AFF*INT	-	-	0.021**
Log-likelihood (LL)	-107.75	-104.10	-98.64
<i>Predictive ability</i>			
Proportion correct	0.773	0.809	0.813
$C_{pro}$	0.530	0.530	0.530
$C_{max}$	0.630	0.630	0.630

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

pected that affordability perceptions predicted by purchase intentions alone ( $\chi^2(1) = 7.3$ ,  $p < 0.10$ ). The significant AF\*INT ( $\beta = 0.021$ ,  $\chi^2(2) = 18.22$ ,  $p < 0.01$ ).

The significant AF\*INT interaction term indicates that the relationship between purchase intentions and purchase at various times of the day varies. Thus, affordability perceptions have a direct and independent influence on purchase intent.

#### Level of AFF

Low  
Average  
High

\*\*\*  $p < 0.01$ .

While the LR test indicates that the predictive performance of the model is significant, the model is unable to discriminate between purchasers and non-purchasers. Using a confusion matrix (Morrison, 1969) exercise was noted. The proportion of correct classifications for the three models estimated in the study are: model 1 (0.773), model 2 (0.809) and model 3 (0.813). Given that the predictive performance of the model is significant, the measure of affordability perceptions influ-

J 325-546

A.S. Natani / Journal of Economic Psychology 18 (1997) 525-546

535

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M3
-0.083
-0.128
0.021**
-98.64
0.813
0.530
0.630

pected that affordability perceptions would predict behavior better than that predicted by purchase intention alone. Consistent with this expectation, AFF ( $\beta = 0.099, p < 0.10$ ) predicted purchase better than the model with INT alone ( $\chi^2(1) = 7.3, p < 0.01$ ). In addition, as expected, the inclusion of AFF\*INT ( $\beta = 0.021, p < 0.05$ ) further improved the fit of the model ( $\chi^2(2) = 18.22, p < 0.01$ ).

The significant AFF\*INT term implies that purchase is the strongest when both purchase intent and affordability are strong. Based on the regression estimates of model 3 from Table 3, we present the effect of purchase intent on purchase at various levels of affordability. These results show that the relationship between purchase intentions and purchase is such that the impact of purchase intention on purchase is stronger at higher levels of affordability. Thus, affordability perceptions moderate the purchase intention-purchase relationship.

Level of AFF	$\delta PUR/\delta INT$	t-value
Low	0.112	3.50***
Average	0.223	8.26***
High	0.334	7.42***

\*\*\*  $p < 0.01$ .

While the LR test provides evidence for the descriptive performance of the model, the predictive performance of the model was also evaluated. The predictive performance of the model indicates how well the independent variables discriminate among the two groups, namely the purchasers versus the non-purchasers. Using estimates from the logit model, a discriminant (classification) exercise was performed and the proportion of correct predictions was noted. The proportion of correct predictions was compared to the proportional chance criterion,  $C_{pro}$  and the maximum chance criterion,  $C_{max}$  (Morrison, 1969). Table 5 provides evidence for the predictive ability of the three models estimated. Model 1 correctly predicted behavior in 77.3% of the cases, model 2 in 80.9% and model 3 in 81.3%. All models exceeded the  $C_{pro}$  and the  $C_{max}$  criterion. However, model 3 performed the best by correctly classifying purchasers and non-purchasers in 81.3% of the cases.

Given that prediction of actual purchase can be enhanced by including a measure of affordability perceptions, what is the process by which affordability perceptions influence actual purchase? Would a lack of financial resources

Table 4

Testing for purchase intention as a mediator of the affordability purchase relationship: Valentine's day gift scenario

Condition	Regression equation
1	AFF (0.581 <sup>***</sup> ) influences INT
2	AFF (0.191 <sup>***</sup> ) influences PUR
3	INT (0.205 <sup>***</sup> ) influences PUR and marginally decreases the influence of AFF (0.099 <sup>**</sup> ) on PUR

Note: PUR stands for purchase. \* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

lead to poor purchase intentions, which in turn lead to a non-purchase? That is, would a perception that you cannot afford a product have its effect on actual purchase through poor purchase intentions or, can affordability perceptions affect actual purchase directly? Mediation analysis was conducted to answer this question, the results of which are given in Table 4. The results show that AFF influences both INT (0.581,  $p < 0.01$ ) and PUR (0.191,  $p < 0.01$ ). In addition, the effect of AFF (0.099,  $p < 0.05$ ) is reduced when the effect of INT is controlled for. The  $\beta$  coefficient for AFF drops from 0.191 in the second regression equation to 0.099 in the third. These results show that purchase intention only marginally mediates the effect of affordability perception on purchase, and that affordability perceptions have a direct, independent influence on actual purchase.

#### 4.2. Celebration scenario

##### 4.2.1. Predicting purchase intentions

The results for prediction of purchase intentions are given in Table 5. It was hypothesized that the inclusion of affordability perceptions would add explained variance over and above that provided by attitude and subjective norms in predicting intentions. As can be seen from model 1, ATT ( $\beta = 0.618$ ,  $p < 0.01$ ) and SN ( $\beta = 0.181$ ,  $p < 0.05$ ) resulted in an  $R^2_{adj}$  of 0.48. The inclusion of AFF (model 2) resulted in a significant effect ( $\beta = 0.226$ ,  $p < 0.01$ ) and increased the  $R^2_{adj}$  to 0.52. The variance explained by model 2 is significantly greater than that explained by model 1 ( $F(1, 153) = 13.33$ ,  $p < 0.01$ ). Further, as can be seen in model 3, the inclusion of the interaction terms AFF\*ATT ( $\beta = 0.870$ ,  $p < 0.05$ ) and AFF\*SN ( $\beta = -0.546$ ,  $p < 0.05$ ) resulted in an  $R^2_{adj}$  of 0.55. The variance explained by model 3 is significantly greater than that explained by model 2 ( $F(2, 151) = 5.17$ ,  $p < 0.01$ ). These results for predicting intentions for the

Table 5

Predicting purchase intention

Variable	MI
	std. $\beta$
ATT	0.618 <sup>***</sup>
SN	0.181 <sup>**</sup>
AFF	-
AFF*ATT	-
AFF*SN	-
$R^2_{adj}$	0.48

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

celebration scenario found that perceptions over and above affordability, variance simultaneously predicted the ability to afford the ability to afford.

#### Level of AFF

Low  
Average  
High

\*\*\* $p < 0.01$ .

Based on the results for the AFF\*ATT presented below, norms and intentions relationship between attitudes and intentions is strong subjective norms on intentions is very strong. As in the case of purchase intentions, it is used to determine whether

25-546

A.S. Nowani / Journal of Economic Psychology 18 (1997) 525-546

537

relationship: Valentine's day gift

as the influence

non-purchase? That have its effect on affordability perceptions was conducted to Table 4. The results ( $p < 0.01$ ) and PUR ( $p < 0.05$ ) is reduced for AFF drops from third. These results the effect of affordability perceptions have a direct,

given in Table 5. It perceptions would add attitude and subjective norm model 1, ATT resulted in an  $R^2_{adj}$  of a significant effect the variance explained gained by model 1 in model 3, the inclusion ( $p < 0.05$ ) and AFF\*SN variance explained by gained by model 2 significant intentions for the

Table 5  
 Predicting purchase intentions: celebration scenario

Variables	M1		M2		M3	
	std. $\beta$	b	std. $\beta$	b	std. $\beta$	b
ATT	0.618***	0.462	0.576**	0.431	0.165	0.134
SN	0.181**	0.079	0.174**	0.076	0.660*	0.289
AFF	-	-	0.226***	0.259	-0.308	-0.352
AFF*ATT	-	-	-	-	0.870**	0.020
AFF*SN	-	-	-	-	-0.546**	-0.013
$R^2_{adj}$	0.48		0.53		0.55	

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

celebration scenario are parallel to those for the Valentine's scenario. It was found that perceptions of affordability increase variance explained in intentions over and above that explained by attitude and subjective norms. Additionally, variance explained in intentions was further increased if subjects simultaneously possessed (1) a positive attitude toward celebrating and the ability to afford the celebration, and (2) social pressures to celebrate and the ability to afford the celebration.

Level of AFF	$\delta INT / \delta ATT$	t-value	$\delta INT / \delta SN$	t-value
Low	0.360	9.73***	0.136	3.34***
Average	0.454	58.96***	0.076	3.85***
High	0.544	14.70***	0.015	0.49

\*\*\*  $p < 0.01$ .

Based on the regression estimates of model 3 from Table 5, simple effects for the AFF\*ATT and AFF\*SN interactions were calculated. These results, presented below, show that the relationship between attitude/subjective norms and intentions is moderated by affordability perceptions. The relationship between attitude and intentions is such that the impact of attitude on intentions is stronger at higher levels of affordability. The relationship between subjective norms and intentions is such that the impact of subjective norms on intentions is weaker at higher levels of affordability perceptions.

As in the case of the Valentine's scenario, mediation analysis was conducted to determine whether affordability perceptions influence purchase intention

Table 6  
Testing for attitude as a mediator of the affordability perception-intention relationship: celebration scenario

Condition	Regression equation
1	AFF (0.298 <sup>**</sup> ) influences ATT
2	AFF (0.426 <sup>***</sup> ) influences INT
3	ATT (0.476 <sup>***</sup> ) influences INT and marginally decreases the influence of AFF (0.259 <sup>***</sup> ) on INT

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

through attitude or whether they affect it directly. The results of this analysis are given in Table 6. These results show that AFF influences both ATT (0.298,  $p < 0.05$ ) and INT (0.426,  $p < 0.01$ ). In addition the effect of AFF (0.259,  $p < 0.01$ ) on INT is reduced when ATT is controlled for. These results show that attitude only marginally mediates the effect of affordability perceptions on purchase intention; instead, affordability perceptions have a direct effect on purchase intention that is independent of attitude.

#### 4.2.2. Predicting actual purchase

Out of the 116 respondents available at time 2, 37 (31.9%) reported celebrating the completion of mid-term exams by going out to dinner, a sporting event, or a rock concert. Since the respondents perceived the celebration scenario as more easily affordable than the Valentine's scenario ( $t = 5.55$ ,  $p < 0.01$ ), we could expect that affordability perceptions would not play a significant role in predicting purchase for this scenario. The results for the prediction of behavior are given in Table 7. For the celebration sce-

Table 7  
Predicting purchase: celebration scenario

Variable	M1	M2	M3
INT	0.192 <sup>***</sup>	0.178 <sup>***</sup>	0.165
AFF	-	0.052	0.039
AFF*INT	-	-	0.001
Log-likelihood (LL)	-127.13	-126.24	-126.24
<i>Predictive ability</i>			
Proportion correct	0.704	0.704	0.704
$C_{opt}$	0.250	0.250	0.250
$C_{max}$	0.690	0.690	0.690

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

nario, the additional behavior better predict behavior better. Based on regression analysis, the effect of affordability perceptions on purchase intention on calculated and is:

#### Level of AFF

Low  
Average  
High

\*\*\*  $p < 0.01$ .

Although we did "simple effects" where purchase is greater at of the celebration affordability perceptions.

Table 7 provides information on the predicted purchase intentions. It can be seen that purchase intentions exceed both affordability perceptions and purchase intentions predicted by interaction terms.

As in the case of the Valentine's scenario, we need to determine the effect of affordability perceptions on actual purchase. The results show that AFF affects purchase intentions. In addition, the effect of AFF on purchase intentions is significant.

Table 8  
Testing for the purchase intention: celebration scenario

Condition	Regression equation
1	AFF
2	AFF
3	INT

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

15-546

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M3
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nario, the addition of AFF (model 2) and AFF\*INT (model 3) did not predict behavior better than that predicted by INT alone.

Based on regression estimates of model 3 from Table 7, the impact of purchase intention on purchase at various levels of affordability perceptions was calculated and is shown below.

Level of AFF	$\delta PUR/\delta INT$	t-value
Low	0.177	2.91***
Average	0.181	3.55***
High	0.186	2.91***

\*\*\*  $p < 0.01$ .

Although we did not find a significant effect for the AFF\*INT term, the "simple effects" were significant. The impact of purchase intention on purchase is greater at higher levels of affordability perceptions. Thus, in the case of the celebration scenario, we find weak support for our hypothesis that affordability perceptions moderate the purchase intent-purchase link.

Table 7 provides evidence for the predictive ability of the three models estimated. It can be seen that all three models correctly classified purchaser and non-purchasers in 70.4% of the cases. The proportion of correct classifications exceed both the  $C_{pro}$  and  $C_{max}$  criterion. Thus, as was expected, including perceptions of affordability did not predict behavior better than that predicted by intention alone.

As in the case of the Valentine's scenario, mediation analysis was conducted to determine the process by which affordability perceptions influence actual purchase. The results for this analysis are given in Table 8. It can be seen that AFF affects both INT (0.426,  $p < 0.01$ ) and PUR (0.098,  $p < 0.05$ ). In addition, the affect of AFF (0.052, ns) on PUR is reduced to non-significance

Table 8  
Testing for the purchase intention as a mediator of the affordability perception-purchase relationship: celebration scenario

Condition	Regression equation
1	AFF (0.426***) influences INT
2	AFF (0.098**) influences PUR
3	INT (0.178***) influences PUR and decreases the influence of AFF (0.052ns) on PUR

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

when INT is controlled for. These results show that in the case of this scenario which was perceived as more easily affordable by the sample, the effect of affordability perceptions on actual purchase was completely mediated by purchase intention.

## 5. Discussion

This study examined the role played by perceptions of affordability in predicting purchase intent and purchase. Two scenarios varying in expensiveness were examined. As expected, both exhibited parallel results for the prediction of purchase intention but dissimilar for prediction of actual purchase. First we discuss the results pertaining to purchase intention and then those pertaining to purchase. This is followed by a discussion of limitations and suggestions for future research and implications for practice.

### 5.1. Impact of affordability perceptions on purchase intention

In predicting intentions for both the scenarios, it was found that perceptions of affordability explained more variance than attitudes and subjective norms alone. This implies that besides possessing a positive attitude and social pressures to perform the behavior, perceptions of whether one feels he/she can afford the product explains significantly more variance in intention. Thus, the effect of affordability perceptions on purchase intentions is not captured by attitude or subjective norms. More importantly, it showed that the relationship amongst attitude, subjective norms, intention, and affordability is more complex than implied by simple main effects. Specifically, it was found that the attitude-purchase intention and subjective norm-purchase intention relationships are moderated by perceptions of affordability. It was found that possessing simultaneously both a positive attitude towards performing the behavior and strong affordability perceptions leads to the strongest intentions. As perceptions of affordability were found to get stronger, the impact of a positive attitude on intention became stronger. This is evident from the model that best fit the data, namely, model 3. The results from this model showed that a positive attitude, or strong perceptions of affordability were not sufficient by themselves to influence intentions, but in combination they had a strong influence on it. That is, the effect of attitude and affordability perceptions on purchase intentions is best explained by their interaction.

It was also found that social pressures to perform the behavior, perceptions of whether one feels he/she can afford the product explains significantly more variance in intention. Thus, the effect of affordability perceptions on purchase intentions is not captured by attitude or subjective norms. More importantly, it showed that the relationship amongst attitude, subjective norms, intention, and affordability is more complex than implied by simple main effects. Specifically, it was found that the attitude-purchase intention and subjective norm-purchase intention relationships are moderated by perceptions of affordability. It was found that possessing simultaneously both a positive attitude towards performing the behavior and strong affordability perceptions leads to the strongest intentions. As perceptions of affordability were found to get stronger, the impact of a positive attitude on intention became stronger. This is evident from the model that best fit the data, namely, model 3. The results from this model showed that a positive attitude, or strong perceptions of affordability were not sufficient by themselves to influence intentions, but in combination they had a strong influence on it. That is, the effect of attitude and affordability perceptions on purchase intentions is best explained by their interaction.

Our study also examined the role played by perceptions of affordability in predicting purchase intent and purchase. Two scenarios varying in expensiveness were examined. As expected, both exhibited parallel results for the prediction of purchase intention but dissimilar for prediction of actual purchase. First we discuss the results pertaining to purchase intention and then those pertaining to purchase. This is followed by a discussion of limitations and suggestions for future research and implications for practice.

### 5.2. Impact of affordability perceptions on purchase

We found that the effect of affordability perceptions on purchase intentions is not captured by attitude or subjective norms. More importantly, it showed that the relationship amongst attitude, subjective norms, intention, and affordability is more complex than implied by simple main effects. Specifically, it was found that the attitude-purchase intention and subjective norm-purchase intention relationships are moderated by perceptions of affordability. It was found that possessing simultaneously both a positive attitude towards performing the behavior and strong affordability perceptions leads to the strongest intentions. As perceptions of affordability were found to get stronger, the impact of a positive attitude on intention became stronger. This is evident from the model that best fit the data, namely, model 3. The results from this model showed that a positive attitude, or strong perceptions of affordability were not sufficient by themselves to influence intentions, but in combination they had a strong influence on it. That is, the effect of attitude and affordability perceptions on purchase intentions is best explained by their interaction.

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A.S. Netani / *Journal of Economic Psychology* 18 (1997) 325-346

341

It was also found for both scenarios, that possessing simultaneously both social pressures to buy a product and strong affordability perceptions leads to strong intentions. However, when the respondents perceived they could easily afford to engage in the behavior, subjective norms had a weaker influence on intention to engage in those behaviors compared to when they felt they could not afford to do so. That is, the respondents cared less about other people's opinion when they could afford to buy a gift for Valentine's day or go out to celebrate. This is an interesting finding because it shows that in predicting purchase intent, perceptions of affordability combine differently with personal evaluation of a purchase as reflected in attitude and differently with social pressures as reflected in subjective norms.

Our study also demonstrated the process by which affordability perceptions influence purchase intent. Is the effect of affordability perceptions on purchase intent mediated by attitude or, can affordability perceptions have a direct and independent influence on purchase intentions? We found that the effect of affordability perceptions on purchase intent is not mediated by attitude. That is, a person can have a positive attitude toward buying something inspite of knowing that he/she does not intend to buy it because of financial constraints. Thus, affordability perceptions can have a direct affect on purchase intentions that is independent of attitude.

### 5.2. *Impact of affordability perceptions on purchase*

We found that perceptions of affordability significantly influenced purchase over and above intention alone. Further, purchase intention and affordability perceptions interacted to explain purchase. That is, purchase was best predicted when individuals simultaneously possess both the motivation to buy (in the form of intention) and the ability to do so (in the form of affordability perceptions). However, as was expected, this was true only for the scenario perceived as more expensive by the respondents. This finding is consistent with the Theory of Planned Behavior (TPB) (Ajzen, 1985) which postulates that for behaviors over which individuals feel they have limited control, a measure of perceived behavioral control would be of considerable value in predicting behavior. When individuals perceive barriers to performing a behavior due to lack of skill, opportunities, or resources, a measure of perceived behavioral control should be used in addition to a measure of behavioral intention. When an individual perceives that he/she has control over the behavior, the concept of perceived behavioral control is irrelevant for predicting behavior; a measure of intention alone should suffice. In the context

of the present study, our sample found it significantly easier to afford \$10-\$25 than \$25-\$50. These conditions make the celebration scenario more under volitional control than the Valentine's day gift scenario.

Our results shed some light on the process by which affordability perceptions affect actual purchase. Is the effect of affordability perceptions on purchase mediated by purchase intent? Or, do affordability perceptions have a direct, independent influence on purchase? We found for the scenario that the sample perceived as more easily affordable (celebration), the effect of affordability perception on actual purchase was completely mediated by purchase intention. On the other hand, for the product that the sample perceived as more expensive (Valentine's gift), affordability perceptions had an independent and direct influence on actual purchase that was not mediated by purchase intentions. Thus, affordability perceptions contain information pertinent to purchase that is not captured by intention measures.

Some support for the importance of financial resources vis-a-vis purchase intent measures in predicting purchase comes from Morwitz and Schmittlein (1992). These authors examined whether segmentation techniques could be used to predict which intenders actually bought a car or a personal computer. Using a large panel of households, they found that the same factors that correlated with propensity to buy also correlated with propensity to fulfill intent. In fact, those who actually purchased came from a segment that had a high propensity to buy (high income, prior product usage), regardless of their stated intent. The authors suggest that this implies that intention measures do not capture underlying propensity to buy that is captured by measures of income, prior product usage etc. These results are consistent with ours and show that when people indicate a positive purchase intention, they may not sufficiently account for affordability. One possibility could be that people anchor on attitude or liking and do not sufficiently adjust for factors like affordability that are less explicit (Tversky and Kahneman, 1974).

### 5.3. Limitations and suggestions for future research

The results of our investigation into the role of affordability perceptions in predicting purchase intent and purchase are encouraging. However, this study has a number of limitations. First, since we employed a convenience sample, the generalizability of our results is limited. Future research should examine whether a similar pattern of results emerges for the general population. Second, we examined only two scenarios varying in expensiveness. In future research, using pretests, a variety of products with price levels ranging

from the absolute of affordability perceived. Third, our study was a limitation since it was a gift/dinner for.

In future research, the effect could be manipulated via the experimental degrees of affordability to isolate causality is implied in a lab study could, e.g. buy something is better if a person has a positive attitude.

### 5.4. Implications for

Market research measures for the prediction of purchase including a simple measure of affordability is better than that of purchase of affordability purchase by 4%.

It should be noted that the effect of an anchor to influence actual purchase is successfully manipulated by converting and even credit cardable. The popularity of an anchor play an important role in predicting purchase.

In predicting purchase rather than observing that affordability is a positive measure of income on credit, consumers might be more likely to do so. The representation of a

5-546

A.S. Notani / Journal of Economic Psychology 18 (1997) 525-546

543

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from the absolute lowest to the very highest should be determined. The role of affordability perceptions over a large range of products should be examined. Third, our use of Valentine's Day as one of the purchase contexts was a limitation since not everyone has a partner or somebody else to buy a gift/dinner for.

In future research, the role of affordability perceptions should also be examined via the experimental method. For example, affordability perceptions could be manipulated by allotting different groups, different budgets and different degrees of access to credit. An advantage of this technique would be its ability to isolate cause and effect. In a survey study such as ours, though causality is implied in modeling, the true direction is not known. An experimental study could, e.g., explore whether a person perceives she/he can afford to buy something is because she/he has a positive attitude towards it, or, whether a person has a positive attitude towards it because she/he can afford to buy it.

#### 5.4. Implications for practice

Market researchers regularly employ attitudinal and purchase intention measures for the purpose of predicting purchase. Our results show that including a simple measure of affordability perceptions can predict purchase better than that predicted by purchase intention alone. By including a measure of affordability perceptions we were able to increase the prediction of purchase by 4%.

It should be noted that affordability perceptions are a psychological manifestation of an economic variable; and these perceptions may have the power to influence actual purchase. Thus, if perceptions of affordability can be successfully manipulated to make a product appear affordable, there is the possibility of converting a non-purchase to purchase. In fact, instalment plans, and even credit cards have the effect of making products seem more affordable. The popularity of such devices shows that perceptions of affordability play an important role in facilitating purchase.

In predicting purchase, we examined the role of perceptions of affordability rather than objective measures of income. There are reasons to suspect that affordability perceptions might play a more important role than objective measures of income in predicting purchase. First, if goods are available on credit, consumers can buy them even if their income alone would not permit them to do so. Thus, measures of income alone may not be an accurate representation of what consumers can really afford to buy. Reports show that

credit card purchases account for 13.5% of overall consumer spending in the US (Waldrop, 1992) and their use is increasing at an alarming rate around the world (Economist, 1992; The New York Times, 1994; Savic, 1991). A large percentage of consumers use credit cards for their revolving credit property for the purpose of increased consumption (Ausubel, 1991). Further, in spite of the high interest rates charged by credit card companies, which results in high final product costs, a large percentage of consumers are insensitive to interest rates (Ausubel, 1991; Federal Reserve Bulletin, 1992). Second, people with identical incomes may have different affordability perceptions due to differences in influences from neighbors, levels of optimism about the future, desire to acquire material goods, attitude towards credit, locus of control, self-efficacy, view of money as a source of power, sensation-seeking, non-conformist tendencies, thus making them differentially prone to debt (Lea et al., 1993; Tokunaga, 1993). In a study designed to examine psychological, economic, and social predictors of personal debt, Livingstone and Lunt (1992) found that a key financial factor like disposable income was unrelated to indebtedness. Instead, the authors found that psychological factors like being pro-credit, seeing credit as useful, were significant predictors of indebtedness. Other researchers too have found that psychological variables like external locus of control. Moreover, in comparing objective measures of income and subjective evaluations of household finances, some researchers found that the latter were superior in predicting certain kinds of consumer expenditure (e.g., Williams and Defris, 1981; Wells et al., 1986). The contribution of affordability perceptions versus objective measures of income in predicting purchase should be examined in future research.

### Acknowledgements

The author would like to thank Michel Tuan Pham, Robert Kent and two anonymous reviewers for their helpful comments on previous drafts of this manuscript.

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A.S. Notoji / Journal of Economic Psychology 18 (1997) 525-546

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**Abstract**

Keynes argued that  
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theory have been plagu  
of future profits. The C  
of future profits. The C  
weight assigned by ma  
most industries, invest  
hibit greater confidence

*PsycINFO classification*

*IEL classification:* B12

*Keywords:* Keynes; Pre

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## Appendix D— OPASTCO Subscriber Survey Description



Words appearing in **BOLD** are defined in Appendix A—Glossary

**B**ecause virtually all subscribers served by OPASTCO **local exchange carrier** member companies are rural, the survey sample was developed from these subscribers so as to have a purely rural sample. The OPASTCO membership list of companies, along with the number of **access lines** each company serves, was entered into a **database** and stratified by **region** (Northeast, Southeast, Midwest, Northwest, and Southwest). Twenty companies then were randomly selected from the list. Also, two alternate companies were randomly selected for each of the original companies selected.

The randomly selected companies were called and asked to participate in the survey. If the company refused, then the first alternate for that company was asked to participate and so on. Nineteen of the 20 companies who ultimately participated were among the companies in the original three randomly generated lists. In one instance, a fourth company had to be selected in order to complete the group of 20 companies.

Each of the 20 companies who agreed to participate was asked to generate a random sample of 250 subscribers from their subscriber list. These lists constituted the actual sample of 5,000 rural subscribers who received the survey. The lists included both residential and business subscribers.

### The Survey Instrument

The survey instrument included four sections: communications services, communications equipment, community, and background. Because the survey went to both business and residential subscribers, the instrument sections on community and background were further divided by residential and business.

The survey included a combination of questions for which respondents could check the box or boxes that applied and questions that required them to fill in a blank. In addition, a space provided at the end of the survey allowed respondents to give their reaction to the survey or to write anything they thought was important but had not been asked on the survey.

The communications services section asked about all the communications services the respondents subscribe to or use regularly; whether they have single- or party-line telephone service; and

whether they have 911 emergency service, **extended area service**, and TouchTone service. This section also included questions about subscribers' perception of what they would do if the price of their telephone service increased and about the amount and diversity of their telephone use.

The second section of the survey asked about the different communications equipment the respondents have, including the available options on their telephone equipment, the number of lines they have, whether they possess a calling card, and whether they rent or own their telephones.

The third section asked about respondents' community and their use of the telephone in conjunction with community participation. This section differed for residential and business subscribers. Residential respondents were asked about their participation in community organizations and whether they know and take messages for someone who does not have a telephone. Businesses were asked about their participation in and/or sponsorship of community organizations and the use of their business telephone in conjunction with those activities.

Both residential and business respondents also were asked about their distance from schools, hospitals, and doctors to ascertain the current availability of services that could be augmented by telecommunications solutions in the future in rural communities. The survey also asked the distance respondents travel to work in order to understand the potential for telecommuting.

The final survey section asked for background information on the residence or business. This included questions about employment, presence of someone in the household who is chronically ill or disabled, household income, type of residence, length of time at the residence, occupation, education, and other demographics known to be related to telephone use.

Overall, the survey was nine pages. Residential respondents were asked to answer 51 questions, and business respondents were asked to answer 43 questions. Each respondent needed to complete seven of the nine pages.

### The Survey Procedure

Each of the 20 companies that agreed to participate was sent 250 copies of the survey with a draft cover letter and 250 postage-paid return envelopes addressed to OPASTCO. Each company transferred the draft cover letter to its letterhead and enclosed one dollar, the survey, and the return envelope in a company envelope and mailed it to the 250 randomly chosen subscribers in its area. The surveys were coded by region so that a regional analysis could be conducted.

Subscribers were asked to return the survey no later than November 12, 1993, which allowed seven to 10 days for the subscribers to respond. One exception was made: one company did not mail its surveys until late November due to the loss of the package of surveys. The ultimate cut-off date for this company was December 1.

The survey was fielded in early November to avoid the changing calling patterns that occur during the holiday season. Because the last survey was fielded late, a special code was entered for surveys returned after the original cut-off date. The means of the surveys received before and after the original date were computed and compared. While the *a priori* expectation was that the number of

telephone calls reported on the later surveys would be higher, this was not the case. Hence, the surveys returned late were included in the overall analysis.

### The Survey Response

Of the 5,000 surveys mailed, 2,383 were returned for an overall response rate of 47.7 percent. Of the returns, 1,872 of the residential/both and 201 of the business/both surveys were used in the analysis. Several respondents answered both the residential and business sections of the survey, so based on the actual response information, those filled in for both were assigned to either the business or residential group. If the call volume and/or the total telephone bill was high, the survey was entered as a business response.

The remaining surveys were dropped due to missing data. It should be noted that a mistake in the survey caused some surveys to be returned incomplete, but even then, the surveys were kept for analysis if at all possible. The mistake was in the questions about the household socio-economic information and thus did not affect the business responses. The data displayed in this analysis reflects the missing responses on questions below the line.

The data was entered into two separate databases, one residential and one business. The residential analysis meets a 95 percent confidence level. The business analysis, however, should be considered qualitative because the number of responses is low. This is a function of the population, not the return. It was estimated that on a random basis, no more than 10 percent of the sample would be businesses, and the business response was approximately 9.5 percent.

The survey analysis, consisting primarily of frequencies and contingency analysis controlling for independent variable interaction, is set out in chapters 5 and 6.



ORGANIZATION FOR THE PROTECTION  
AND ADVANCEMENT OF SMALL  
TELEPHONE COMPANIES

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## SURVEY ON RURAL TELEPHONE SERVICE

### INSTRUCTIONS

*This questionnaire is divided into four topic areas: Communication Services, Communication Equipment, Community, and Background. For many questions, you need to check the appropriate box or boxes. There are several questions where you should check as many boxes as apply to you. A few questions require you to fill in the blank with an appropriate number. We would like to thank you in advance, for your participation and cooperation.*

1. Are you a residential or a business telephone subscriber?  Residential  Business  Both
2. Overall, how would you rate the quality of your telephone service? Circle the response below that best describes your opinion.
- Poor          Fair          Good          Excellent

### ABOUT THE COMMUNICATION SERVICES YOU USE

3. Which of the following communication services do you subscribe to or use regularly? (Check all that apply).

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Daily newspaper          | <input type="checkbox"/> Basic cable television       | <input type="checkbox"/> General interest magazines |
| <input type="checkbox"/> Weekly newspaper         | <input type="checkbox"/> Expanded basic cable tv      | <input type="checkbox"/> Special interest magazines |
| <input type="checkbox"/> Newsletter               | <input type="checkbox"/> Premium cable tv             | <input type="checkbox"/> News magazines             |
| <input type="checkbox"/> Paging or beeper service | <input type="checkbox"/> Cable tv special events      | <input type="checkbox"/> Overnight delivery service |
| <input type="checkbox"/> Cellular telephone       | <input type="checkbox"/> Broadcast television         | <input type="checkbox"/> Computer database service  |
| <input type="checkbox"/> Video tape rentals       | <input type="checkbox"/> Telephone service            | <input type="checkbox"/> Computer bulletin board    |
| <input type="checkbox"/> Electronic mail          | <input type="checkbox"/> Other (Please specify) _____ |   |

- a. Of the services you checked, which is the most important? \_\_\_\_\_
- b. Of the services you checked, which is the least important? \_\_\_\_\_
- c. Of the services you checked, which is used most frequently at your premises? \_\_\_\_\_
4. Is your telephone service private line or party line service?  Private line  Party line
5. Do you have TouchTone telephone service?  Yes  No  Don't Know
6. Is free calling to nearby towns included in your basic monthly charge for telephone service?
- Yes  No  Don't Know
7. Is 911 emergency service available to you?  Yes  No  Don't Know
- a. If yes, in a health emergency would you call 911 or your doctor first?  911  Doctor
8. Of the relationships listed below, who would be most frequently called from your premises?
- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Family member | <input type="checkbox"/> Friend                       | <input type="checkbox"/> Fellow association/club member |
| <input type="checkbox"/> Relative      | <input type="checkbox"/> Co-worker                    | <input type="checkbox"/> Business person                |
| <input type="checkbox"/> Government    | <input type="checkbox"/> Other (Please specify) _____ |   |

9. Of the following activities, which have you or others at your premises used the telephone for in the last month? Check all that apply.

- |  |   |
|--|---|
| <input type="checkbox"/> Social contact/Keeping in touch   | <input type="checkbox"/> Handling a crisis            |
| <input type="checkbox"/> Scheduling                        | <input type="checkbox"/> Getting something done       |
| <input type="checkbox"/> Coordinating community activities | <input type="checkbox"/> Getting/giving information   |
|  | <input type="checkbox"/> Other (Please specify) _____ |

- a. Of the telephone uses listed above, which is most important? \_\_\_\_\_
- b. Of the telephone uses listed above, which is least important? \_\_\_\_\_
- c. Of the telephone uses listed above, which is most frequent at your premises? \_\_\_\_\_

10. Which of the following "enhanced" or other telephone services do you currently subscribe to? Check all that apply.

- |  |   |
|--|---|
| <input type="checkbox"/> Call waiting                    | <input type="checkbox"/> Caller ID                    |
| <input type="checkbox"/> Call forwarding                 | <input type="checkbox"/> Call blocking                |
| <input type="checkbox"/> Speed dialing                   | <input type="checkbox"/> Selective call waiting       |
| <input type="checkbox"/> Cancel call waiting             | <input type="checkbox"/> Three-way conference calling |
| <input type="checkbox"/> Distinctive ring/coded ring     | <input type="checkbox"/> Automatic call back          |
| <input type="checkbox"/> Selective call forwarding       | <input type="checkbox"/> Voice mail                   |
| <input type="checkbox"/> Data line conditioning          | <input type="checkbox"/> Automatic redial             |
| <input type="checkbox"/> Call intercept (Do not disturb) | <input type="checkbox"/> Call trace                   |
| <input type="checkbox"/> Wake-up call service            | <input type="checkbox"/> Other (Please specify) _____ |
| <input type="checkbox"/> Inside wiring maintenance       | <input type="checkbox"/> None                         |

11. What is your total bill for telephone services in a typical month? (Include basic local service, telephone rental, extended area service charges, long distance charges, and charges for the additional services that you checked in question 10 above.) \$ \_\_\_\_\_

- a. What is the current monthly charge for basic local telephone service? \$ \_\_\_\_\_
- b. In a typical month, about how much is your long distance telephone bill? \$ \_\_\_\_\_
- c. In a typical month, how much do you pay for extended area service? (Enter "na" if you don't have this service.) \$ \_\_\_\_\_
- d. For all the services you checked in question 10 above, what are the current monthly charges? (Enter "na" if you checked None.) \$ \_\_\_\_\_

12. In the last month, on average, how many local telephone calls per day were received at your premises?

- |                                      |                            |                             |                             |                             |                                     |
|--------------------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------------|
| <input type="checkbox"/> Less than 1 | <input type="checkbox"/> 4 | <input type="checkbox"/> 8  | <input type="checkbox"/> 12 | <input type="checkbox"/> 16 | <input type="checkbox"/> 20 or more |
| <input type="checkbox"/> 1           | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13 | <input type="checkbox"/> 17 | <input type="checkbox"/> Don't Know |
| <input type="checkbox"/> 2           | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14 | <input type="checkbox"/> 18 |                                     |
| <input type="checkbox"/> 3           | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15 | <input type="checkbox"/> 19 |                                     |

13. In the last month, on average, how many local telephone calls per day were placed from your premises?

- |                                      |                            |                             |                             |                             |                                     |
|--------------------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------------|
| <input type="checkbox"/> Less than 1 | <input type="checkbox"/> 4 | <input type="checkbox"/> 8  | <input type="checkbox"/> 12 | <input type="checkbox"/> 16 | <input type="checkbox"/> 20 or more |
| <input type="checkbox"/> 1           | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13 | <input type="checkbox"/> 17 | <input type="checkbox"/> Don't Know |
| <input type="checkbox"/> 2           | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14 | <input type="checkbox"/> 18 |                                     |
| <input type="checkbox"/> 3           | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15 | <input type="checkbox"/> 19 |                                     |

14. If your monthly telephone bill for basic local service were to increase, what would be your most likely response? Choose a response for each dollar amount listed. (Check the box that applies in each column.)

	\$5.00	\$10.00	\$15.00	\$25.00
a. Pay the increased amount.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Reduce long distance use, thereby lowering the overall bill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Reduce spending on the "enhanced" services checked in question 10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Reduce spending on other communication services checked in question 3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Reduce spending in other areas not related to communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Discontinue telephone service completely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other (Please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. If your monthly telephone bill for basic local service were to decrease, what would be your most likely response? Choose a response for each dollar amount listed. (Check the box that applies in each column.)

	\$2.00	\$3.00	\$4.00
a. Use the savings to subscribe to an additional telephone line.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Use the savings to buy "enhanced" services. Refer to question 10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Use the savings on more long distance telephone calls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Use the savings to buy other communication services. Refer to question 3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Use the savings to buy other products or services not related to communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Keep the savings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other (Please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. If you could reduce your telephone bill by paying by the call for local service (like you do for long distance) how likely is it that you would do so? (Please circle the appropriate response below.)

Very Unlikely      Somewhat Unlikely      Don't Know      Somewhat Likely      Very Likely

17. How many long distance calls does your household receive in a month, on average?

<input type="checkbox"/> None	<input type="checkbox"/> 3	<input type="checkbox"/> 7	<input type="checkbox"/> 11	<input type="checkbox"/> 15	<input type="checkbox"/> 19 or more
<input type="checkbox"/> Less than 1	<input type="checkbox"/> 4	<input type="checkbox"/> 8	<input type="checkbox"/> 12	<input type="checkbox"/> 16	<input type="checkbox"/> Don't Know
<input type="checkbox"/> 1	<input type="checkbox"/> 5	<input type="checkbox"/> 9	<input type="checkbox"/> 13	<input type="checkbox"/> 17	
<input type="checkbox"/> 2	<input type="checkbox"/> 6	<input type="checkbox"/> 10	<input type="checkbox"/> 14	<input type="checkbox"/> 18	

18. How many long distance calls does your household make in a month, on average?

<input type="checkbox"/> None	<input type="checkbox"/> 3	<input type="checkbox"/> 7	<input type="checkbox"/> 11	<input type="checkbox"/> 15	<input type="checkbox"/> 19 or more
<input type="checkbox"/> Less than 1	<input type="checkbox"/> 4	<input type="checkbox"/> 8	<input type="checkbox"/> 12	<input type="checkbox"/> 16	<input type="checkbox"/> Don't Know
<input type="checkbox"/> 1	<input type="checkbox"/> 5	<input type="checkbox"/> 9	<input type="checkbox"/> 13	<input type="checkbox"/> 17	
<input type="checkbox"/> 2	<input type="checkbox"/> 6	<input type="checkbox"/> 10	<input type="checkbox"/> 14	<input type="checkbox"/> 18	

Please Continue to the Next Page

19. If your monthly long distance telephone bill were to increase, what is your most likely response? Choose a response for each dollar amount listed. (Check the box that applies in each column.)

	\$5.00	\$10.00	\$15.00	\$25.00
a. Pay the increased amount.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Reduce the number of calls your household makes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Reduce the number of minutes spent on each call.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Reduce both the number of calls and the number of minutes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Make calls only when night/evening discounts are effective.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Reduce your subscription to the "enhanced" telephone services you checked in question 10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Reduce spending on other communication services. Refer to your answer on question 3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Reduce spending in other areas not related to communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Discontinue subscribing to telephone service completely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Other, (Please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. If your monthly long distance telephone bill were to decrease, what is your most likely response? Choose a response for each dollar amount listed. (Check the box that applies in each column.)

	\$2.00	\$3.00	\$4.00
a. Increase the number of calls your household makes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Increase the number of minutes spent on each call.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Increase both the number of calls and the number of minutes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Make more calls during the day instead of waiting for night/evening discounts to be effective.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Increase your subscription to "enhanced" telephone services. Refer to question 10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Increase spending on other communication services. Refer to question 3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Increase spending in areas not related to communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Increase the number of telephone lines subscribed to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Other (Please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Which types of services listed below have been called from your premises in the last 3 months? (Include any calls to telephone numbers beginning with 976, 540 or area code 900 in your response.)

- |                                  |   |   |
|----------------------------------|---|---|
| <input type="checkbox"/> None    | <input type="checkbox"/> Sports line          | <input type="checkbox"/> Other 900 calls              |
| <input type="checkbox"/> Time    | <input type="checkbox"/> News line            | <input type="checkbox"/> Other 976 calls              |
| <input type="checkbox"/> Weather | <input type="checkbox"/> Call-in Opinion Poll | <input type="checkbox"/> Other (Please specify) _____ |

**ABOUT YOUR COMMUNICATION EQUIPMENT**

22. Do you own or rent your telephone(s)?     Own     Rent     Both
23. How many different telephone numbers do you subscribe to? \_\_\_\_\_
24. Do you have a telephone calling card that allows you to make calls from other phones and bill it to your own phone number?     Yes     No

25. Which of the following types of communication equipment do you have? (Check all that apply.)

- |   |  |  |  |
|---|--|--|--|
| <input type="checkbox"/> Dial telephone               | <input type="checkbox"/> Stereo System     | <input type="checkbox"/> TouchTone telephone | <input type="checkbox"/> CD Player (compact disc)      |
| <input type="checkbox"/> Speaker phone                | <input type="checkbox"/> Answering machine | <input type="checkbox"/> Cordless telephone  | <input type="checkbox"/> Computer                      |
| <input type="checkbox"/> Television                   | <input type="checkbox"/> Computer modem    | <input type="checkbox"/> Pager/beeper        | <input type="checkbox"/> Facsimile machine (fax)       |
| <input type="checkbox"/> Cellular phone               | <input type="checkbox"/> CB radio          | <input type="checkbox"/> Video game player   | <input type="checkbox"/> Video cassette recorder       |
| <input type="checkbox"/> Radio                        | <input type="checkbox"/> Satellite dish    | <input type="checkbox"/> TDD                 | <input type="checkbox"/> Cassette player/tape recorder |
| <input type="checkbox"/> Other (Please specify) _____ |  |  |  |

26. Which of the following options are available on one or more of the telephones located on your premises? (Check all that apply.)

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> None                         | <input type="checkbox"/> Flash             | <input type="checkbox"/> Automatic redial           |
| <input type="checkbox"/> Mute                         | <input type="checkbox"/> Volume control    | <input type="checkbox"/> Hold                       |
| <input type="checkbox"/> Pause                        | <input type="checkbox"/> Pulse/tone switch | <input type="checkbox"/> Programmable speed dialing |
| <input type="checkbox"/> Other (please specify) _____ |  |   |

**IF YOU ARE A BUSINESS SUBSCRIBER, SKIP TO  
PAGE 8 QUESTION 52. IF YOU ARE A  
RESIDENTIAL SUBSCRIBER  
CONTINUE TO QUESTION 27.**

#### ABOUT YOUR COMMUNITY

27. Do you know anyone who doesn't have a home telephone?  Yes  No

a. If yes, does your household ever take messages for them on your telephone?

No  Yes If yes, about how often? \_\_\_\_\_

28. Does anyone in your household actively participate in any of the following organizations?

- Local sports leagues (e.g., Little League)
- Neighborhood watch
- PTA or other school organization
- Volunteer firefighters/rescue squad
- Religious group or church
- Service organizations (e.g., Jaycees, Lions, Rotary, etc.)
- Political organizations
- Local chapter of a professional or labor association
- Other volunteer service group or community association (Please specify) \_\_\_\_\_
- None of the above (Go to question 30)

29. If you checked any organization in question 28 above, is your household telephone used to conduct business or schedule events for that organization?

- No  Yes
- If yes, about how often?
- Less than once a month
  - Once a month
  - More than once a month

30. How many miles is it one-way between your work and your home? \_\_\_\_\_
- If there are other household members working please list their one-way mileage between work and home. \_\_\_\_\_
31. How many miles is it one way to the family doctor's office? \_\_\_\_\_
32. How many miles is the nearest hospital from your home?
33. How many miles is the nearest fire/rescue squad from your home? \_\_\_\_\_
34. How many miles are the following local schools from your home? \_\_\_\_\_
- a. Elementary school \_\_\_\_\_
- b. High School \_\_\_\_\_
- c. Community college \_\_\_\_\_
35. How far away does your nearest neighbor live? \_\_\_\_\_

#### ABOUT YOUR HOUSEHOLD

36. Is there anyone handicapped/disabled in your household? [ ] Yes [ ] No
37. Is there anyone with a chronic health problem in your household? [ ] Yes [ ] No
38. Enter the number of people of each age group listed that currently reside in your household.
- |                   |                   |                     |
|-------------------|-------------------|---------------------|
| ___ 0 - 4 years   | ___ 19 - 24 years | ___ 45 - 54 years   |
| ___ 5 - 10 years  | ___ 25 - 34 years | ___ 55 - 64 years   |
| ___ 11 - 18 years | ___ 35 - 44 years | ___ 65 years & over |
39. How many household members are currently employed? (Enter the number in the appropriate line.)
- \_\_\_ full time \_\_\_ part time
40. Of the household members employed, how many are self-employed?
- [ ] None [ ] One [ ] More than one
41. Is anyone in your household currently unemployed? [ ] No (Go to question 42) [ ] Yes
- a. If yes, how long has this household member been unemployed?
- |                         |  |
|-------------------------|--|
| [ ] Less than one month | [ ] More than three months but less than six |
| [ ] One to three months | [ ] Six to twelve months                     |
|                         | [ ] More than one year                       |
42. What is your total household income per year?
- |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
| [ ] Under \$5,000       | [ ] \$15,000 - \$17,499 | [ ] \$35,000 - \$39,999 |
| [ ] \$5,000 - \$7,499   | [ ] \$17,500 - \$19,999 | [ ] \$40,000 - \$49,999 |
| [ ] \$7,500 - \$9,999   | [ ] \$20,000 - \$24,999 | [ ] \$50,000 - \$74,999 |
| [ ] \$10,000 - \$12,499 | [ ] \$25,000 - \$29,999 | [ ] \$75,000 and Over   |
| [ ] \$12,500 - \$14,999 | [ ] \$30,000 - \$34,999 |                         |

43. Of the following categories, which best describes your occupation?

- |   |   |
|---|---|
| <input type="checkbox"/> Professional         | <input type="checkbox"/> Clerical worker/office assistant |
| <input type="checkbox"/> Manager/official     | <input type="checkbox"/> Farmer                           |
| <input type="checkbox"/> Supervisor/foreman   | <input type="checkbox"/> Laborer or operator              |
| <input type="checkbox"/> Owner/proprietor     | <input type="checkbox"/> Craftsman                        |
| <input type="checkbox"/> Technician/repairman | <input type="checkbox"/> Homemaker                        |
| <input type="checkbox"/> Sales/marketing      | <input type="checkbox"/> Student                          |
|   | <input type="checkbox"/> Other (Please specify) _____     |

44. What is the highest level of basic education you completed?

- |  |  |
|--|--|
| <input type="checkbox"/> 7th grade or less     | <input type="checkbox"/> Some college              |
| <input type="checkbox"/> 8th grade             | <input type="checkbox"/> Completed college         |
| <input type="checkbox"/> Some high school      | <input type="checkbox"/> Some graduate school      |
| <input type="checkbox"/> Completed high school | <input type="checkbox"/> Completed graduate school |

45. Have you had any other schooling or training?

- |  |   |
|--|---|
| <input type="checkbox"/> Some vocational school      | <input type="checkbox"/> Job training seminars                        |
| <input type="checkbox"/> Completed vocational school | <input type="checkbox"/> Extension courses                            |
| <input type="checkbox"/> Correspondence school       | <input type="checkbox"/> Other adult education (Please specify) _____ |

46. What is your current marital status?

- Single, never married     Married     Divorced     Widowed     Separated

47. Are you  male     female?

48. Do you rent or own your place of residence?  Own     Rent     Other (Please specify) \_\_\_\_\_

49. How long have you lived at your current residence? \_\_\_\_\_

50. What type of dwelling best describes your current residence?

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Single family house | <input type="checkbox"/> Apartment/Condominium        | <input type="checkbox"/> Extended family house |
| <input type="checkbox"/> Townhouse/Duplex    | <input type="checkbox"/> Other (Please specify) _____ |  |

51. Please provide your area code and the first three digits of your telephone number in the space provided to the right. \_\_\_\_\_

**THANK YOU FOR YOUR TIME, COOPERATION AND PARTICIPATION**

If you have any comments about our questionnaire or additional information that you would like to provide, we encourage you to use the space provided below to do so. If you would like to know the results of the survey you may call OPASTCO at (202) 659-5990. Call collect. Or you can drop us a line with your name and address and we will mail a copy to you. In order to protect your confidentiality, please do not include your name and address when returning this survey return.

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**IF YOU ARE A RESIDENTIAL SUBSCRIBER, STOP HERE!!**

## ABOUT YOUR COMMUNITY

52. Does your business belong to any community business organizations (e.g., the local Chamber of Commerce)?  Yes  No
- a. If yes, is your business telephone ever used to conduct business for that organization?
- No  Yes      If yes, about how often?
- Less than once a month
- Once a month
- More than once a month
53. Does your business sponsor or help raise funds for other non-business or community service organizations?  Yes  No
- a. If yes, is your business telephone ever used to raise support or funding for such organizations?
- No  Yes If yes, about how often?
- Less than once a month
- Once a month
- More than once a month
54. Does your business belong to any national business or professional associations in which you actively participate?  Yes  No
- a. If yes, is your business telephone ever used to conduct business for that organization?
- No  Yes      If yes, about how often?
- Less than once a month
- Once a month
- More than once a month
55. How many miles is the nearest hospital from your business? \_\_\_\_\_
56. How many miles is the nearest fire/rescue squad? \_\_\_\_\_
57. How many miles are the following local schools?
- a. Elementary school \_\_\_\_\_
- b. High School \_\_\_\_\_
- c. Community college \_\_\_\_\_

## ABOUT YOUR BUSINESS

58. How many people does your business employ? \_\_\_\_\_
59. Of the industrial groups listed below, which best describes the primary activity of your company?
- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Agriculture/Fishing  | <input type="checkbox"/> Other Services               | <input type="checkbox"/> Mining            |
| <input type="checkbox"/> Forestry             | <input type="checkbox"/> Construction                 | <input type="checkbox"/> Real Estate       |
| <input type="checkbox"/> Manufacturing        | <input type="checkbox"/> Insurance                    | <input type="checkbox"/> Wholesale Trade   |
| <input type="checkbox"/> Finance              | <input type="checkbox"/> Retail Trade                 | <input type="checkbox"/> Medicine          |
| <input type="checkbox"/> Tourism/Recreation   | <input type="checkbox"/> Education                    | <input type="checkbox"/> Transportation    |
| <input type="checkbox"/> Business Services    | <input type="checkbox"/> Communication                | <input type="checkbox"/> Personal Services |
| <input type="checkbox"/> Information Services | <input type="checkbox"/> Other (Please specify) _____ |  |
60. What were your gross revenues for 1992? \_\_\_\_\_

61. Do you own, rent or lease your business premises?  Own  Rent  Lease
62. What percentage of your operating expenses are attributable to telecommunications costs? \_\_\_\_\_
63. Is your business a franchise?  Yes  No
64. Which of the following best describes your business?  
 Sole proprietorship  Partnership  
 Corporation  Other (Please specify) \_\_\_\_\_
65. How many years has your company been in business? \_\_\_\_\_
66. If your business experienced an increase in your total monthly telephone bill, at what percentage increase might you consider relocating to an urban area where the cost of telephone service was the same or less than you had been paying before the increase?  
 25%  50%  
 100%  200%  
 Wouldn't relocate because of a telephone bill increase.  
 Don't Know
67. If your business experienced an increase in your total monthly telephone bill, at what percentage would that increase have an effect on your plans to expand your business?  
 25%  50%  
 100%  200%  
 Wouldn't change expansion plans because of a telephone bill increase.  
 Don't Know
68. Please provide your area code and the first three digits of your telephone number in the space provided to the right. \_\_\_\_\_

**THANK YOU FOR YOUR TIME, COOPERATION AND PARTICIPATION**

If you have any comments about our questionnaire or additional information that you would like to provide, we encourage you to use the space provided below to do so. If you would like to know the results of the survey you may call OPASTCO at (202) 659-5990. Call collect. Or you can drop us a line with your name and address and we will mail a copy to you. In order to protect your confidentiality, please do not include your name and address when you return the survey.

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## 'Can Pay? Won't Pay?' or Economic Principles of 'Affordability'

K. E. Hancock

[Paper first received, and in final form, July 1991]

**Summary.** The term 'affordability' has been gaining currency in housing policy debates, but neither government nor academic researchers have given much consideration to defining it. This paper considers what meanings have been given to the term affordability in practice and suggests a range of analytically more useful definitions. It argues from economic first principles that it is more logical to use some form of residual income definition than one based on a prescribed ratio of housing costs to income. Most researchers have been using a ratio definition. The paper then uses data from a household survey in the Glasgow Travel-to-Work Area in 1988/89 to examine the incidence of 'unaffordability' of housing costs according to a variety of definitions.

### Introduction

This paper examines the possible meanings of the concept of 'affordability' in connection with individuals' housing costs. It begins with an overview of definitions in current usage and concludes that current practice would benefit from an analysis of the concept based on economic first principles. The main purpose of this paper is to propose a set of analytically more meaningful definitions than many of those currently employed. Data from a survey of incomes and housing costs are used to examine the incidence of 'unaffordability' of housing costs in the Glasgow Travel-to-Work Area in 1988/89 according to a variety of definitions.

### Current Usage

The term 'affordability' has become topical in policy debates about two housing

tenures (see Bramley, 1990a and 1990; MacLennan and Williams, 1990; and Kearns, 1992). First, there have been concerns about the affordability of owner-occupation brought about by rapidly-rising house prices in certain parts of the country, the abolition of double tax relief for unmarried couples, rises in interest rates and economic recession. Increases in building society reposessions and mortgage arrears have become newsworthy in this climate (Anderson, 1990). As well as concerns about the impacts of these factors on existing buyers, there are also worries about their effects upon access to owner-occupation among the population of potential first-time buyers.

The second area in which the concept of affordability of housing has achieved currency is in the housing association sector. Associations, since the new funding regime

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of post-1988, have been urged to abandon the old principles of rent-selling whereby rent officers determined so-called fair rents for properties. In their place, they are being asked to set 'affordable rents', with the presumption that affordable rents will exceed fair rents. However, as Kearns (1992) and Bramley (1990b) have noted, the government has not set down what the principles of affordable rents are to be, and seems to have given the responsibility of defining affordable rents to the associations themselves. In attempting to determine affordability, large numbers of surveys of tenants' incomes are being carried out by associations.

If associations turned to the literature for guidance, they might well become confused. A brief survey reveals a lack of systematic thought about how affordability might be defined and measured. The majority of writers examine ratios of housing costs to incomes for evidence of affordability. The National Federation of Housing Associations, offering guidance to its members on the setting of affordable rents, argues that what associations require is "some norm for the average ratio between rent and income. This should relate to people beyond the reach of Housing Benefit, i.e., those in employment or on occupational pensions" (NFHA, 1990, p. 27). The organisation suggests a 'target' affordable rent-to-income ratio of 20 per cent. Maclennan and Williams are critical of rent-to-income ratios offered "without definition or much justification" (Maclennan and Williams, 1990, p. 11), and argue that the government should both select the appropriate ratio and also determine what items of income and expenditure should be included in both the numerator and the denominator. Maclennan, Gibb and More (1990) are also highly critical of the use of 'target' affordability ratios. Their argument is that to specify a single ratio of housing costs to incomes across all tenures, locations and household types over-simplifies. Their research shows that actual housing costs vary by tenure, loca-

tion, socio-economic characteristics of households and household incomes. However, they conclude that: "There is no doubt that broad rent-to-income ratios, aggregated across sectors, do signify useful information for economic policy" (Maclennan, Gibb and More, 1990, p. 98). It is my contention that rent-to-income ratios provide, in fact, very misleading information for economic policy.

Affordability is also usually discussed in terms of the ratio of housing costs to incomes or size of loan in relation to incomes in the literature on owner-occupation. For example, Bramley employs 'accessibility' and 'affordability gap' indices of affordability which compare building society multipliers of household incomes—i.e. a measure of loan potential—with various house prices (Bramley, 1990a, 1990b). Edwards, Director of the Australian National Housing Strategy, outlines various measures of affordability widely used in Australia for owners, especially first-time buyers. The factors which he concludes need to be taken into account in an index of affordability for first-time buyers include all the cash costs of purchase, the income of the buyer, and the criteria used by financial institutions to determine loan size, including the assumed deposit of the borrower (about 25 per cent of the house price).<sup>1</sup> Affordability for existing owners is judged by the percentage of average incomes necessary to meet the mortgage repayments on a median-priced house, or some other ratio between cash housing costs and incomes. These indices are tracked over time by commentators and policy-makers. Also employed in the Australian literature is a 'deposit gap' measure of 'accessibility'. This is the number of years' saving required to raise a 25 per cent deposit by a household on median income, at average saving and interest rates (Edwards, 1990).

This paper is concerned with identifying those who may be suffering from unaffordable housing from a household survey carried out in the Glasgow Travel-to-Work

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#### Defining

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Area in 1988/89. This requires a definition of what may be considered to be affordable housing costs. However, determining what is and what is not affordable is quite a different matter for determining affordable rents, since the range of rents which may be considered to be affordable will be very large, even assuming a single measure of affordability commands agreement. Affordable rents are outwith the scope of this paper; rather, what is at issue here is the concept of 'affordability' itself. The overview of some of the more considered parts of the literature on affordability described above, results in the conclusion that there is some merit to be found in a systematic consideration of the meaning and measurement of affordability of housing, beginning from economic first principles, particularly with a view to establishing, or otherwise, the usefulness of ratio measures. This paper is an attempt to begin that task.

#### Defining Affordability

It is useful to begin with two definitions from the literature which appear to give a reasonable starting point. Maclennan and Williams offer a very general definition:

'Affordability' is concerned with securing some given standard of housing (or different standards) at a price or a rent which does not impose, in the eyes of some third party (usually government) an unreasonable burden on household incomes. (Maclennan and Williams, 1990, p. 9)

Bramley's is more specific:

that households should be able to occupy housing that meets well-established (social sector) norms of adequacy (given household type and size) at a net rent which leaves them enough income to live on without falling below some poverty standard. (Bramley, 1990b, p. 16)

Both definitions appear to conceive of non-housing consumption as a merit good.

That is, they appear to say that there is some quantity of non-housing consumption which society regards as a socially-desirable minimum. Bramley's definition describes this as a "poverty standard". Maclennan and Williams's discusses it in terms of an "unreasonable burden".<sup>2</sup> Both definitions are therefore concerned with the notion of the opportunity cost of housing, and clearly this is the essence of the concept of affordability: what has to be foregone in order to obtain housing and whether that which is foregone is reasonable or excessive in some sense. Both definitions are also concerned with the standard of housing consumption. Maclennan and Williams speak of "some given standard of housing" and Bramley of "social sector norms of adequacy". The concern with standards of housing consumption also implies that housing is a merit good in these definitions. Although it is strictly necessary only that non-housing be considered a merit good to warrant a social concern with the affordability of housing, any approach which does not take housing to be a merit good is likely to be considered unreasonable since it implies that even if people are houseless, providing their consumption of other goods reaches acceptable levels, there is no affordability problem.

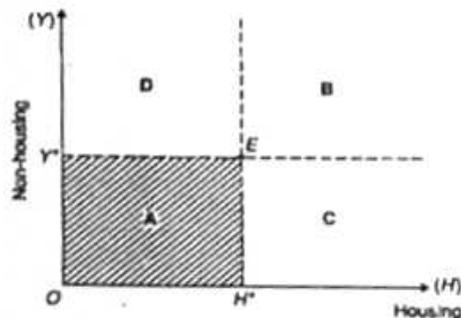


Figure 1. A minimal definition of affordability

Given information on how much housing and non-housing individuals are consuming, together with the socially-desirable

minimum standards of consumption of the two goods, it is possible to determine for some of the population, those for whom affordability is a problem. Figure 1 shows combinations of quantities of housing ( $H$ ) and all other goods ( $Y$ ) being consumed by an individual.  $Y^*$  and  $H^*$  mark the socially-desirable minimum standards of the two goods defined for an individual, since we might expect  $Y^*$  and  $H^*$  to vary according to the size and composition of the household. Point  $E$  on the diagram therefore indicates the consumption bundle about which affordability is concerned. It is possible to say that consumption patterns represented by Region A are indicative of unaffordability of housing: if in this Region, point  $E$  is not even a consumption possibility. Conversely, consumption in area B is indicative of affordability without any ambiguity since the individual is consuming adequate quantities of both goods. Areas C and D are much more problematic. In these regions, the consumer is consuming enough of at least one good, but insufficient of the other. These consumption patterns have a number of possible causes which can be reduced to matters of personal choice and matters of constraints facing the consumer. In order to determine whether individuals in these areas are suffering from problems of affordability, further information is therefore required about their preferences and the opportunities they face.

A conventional economic analysis would be to take the main constraint facing individuals to be their real income—i.e. money income in relation to the prices of goods and services. Assuming that the consumer's real income is just large enough to allow him to purchase  $Y^*$  and  $H^*$ , then his alternative consumption possibilities may be represented by a budget constraint such as  $FG$  in Figure 2. The position of the budget constraint is determined by the consumer's money income; its slope by the relative prices of  $Y$  and  $H$ . Thus any consumer whose actual consumption is within the shaded area, but

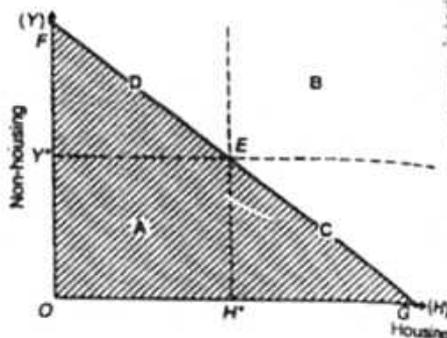


Figure 2. Affordability for an individual consumer.

not on the line  $FG$ , cannot reach  $E$ , given his income and the relative prices of the two goods. It seems reasonable therefore to define the two triangles  $Y^*FE$  and  $H^*GE$  as further areas of unaffordability of housing. Individuals whose consumption pattern is either on the line, or in the unshaded portions of areas C and D, will be consuming too little of either  $Y$  or  $H$  either through choice or because of some other, non-income constraint on their choices.

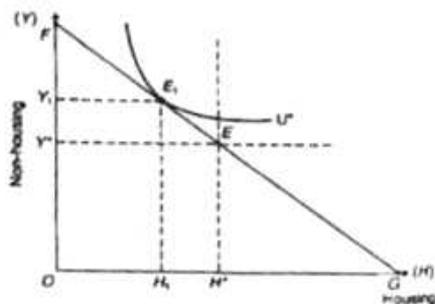


Figure 3. Affordability and 'perverse' preferences.

It is important to distinguish between the two causes of underconsumption because different policies may be appropriate in different cases. Figure 3 shows the preferences and constraints facing a consumer whose income is sufficient to purchase  $Y^*$  and  $H^*$ , but who prefers to

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consume  $Y_1$  and  $H_1$ . This consumer would argue that the socially-acceptable minimum standard of housing is not affordable to him because its opportunity-cost in terms of foregone  $Y$  is too great from his own point of view. He is less happy at  $E$  than at  $E_1$ , in other words. If there are no other constraints facing him, then this is an indication of 'perversity' of preferences:  $Y^*$  and  $H^*$  is a 'can pay, won't pay' combination in this case. Possible policy interventions to induce the consumption of the socially-appropriate bundle of goods include persuasion (advertising), some supplements, price subsidies or physical allocation of the appropriate quantities of the goods. If the consumer were simply allocated  $H^*$  housing, however, with no price or income subsidy, it is likely that he would try to get round the problem of his housing being unaffordable from this point of view, by sub-letting part of his house or allowing rent arrears to accumulate, or simply absconding to the private sector, where choices are less constrained. Allocated housing would therefore either have to be subsidised or checks made to ensure that no sub-letting takes place. It is clear, however, that definitions of affordability must distinguish between the individual's conception of what is and is not affordable, and society's judgement. Consumers' opinions on the difficulty they have in meeting housing costs are of little value for policy-making on their own if policy-makers have already decided that either non-housing goods or housing or both are merit goods.

So far, the analyses have been presented as if it were possible for consumers to vary the quantity of housing they consume by very small amounts. In practice, the opportunities for doing this may be very few. There are indivisibilities in the consumption of housing: certain quantities may simply not be available. If this is the case, then consumers may simply not be able to reach  $E$ , the socially-acceptable consumption bundle, or even  $E_1$ , their optimum. In such cases, the appropriate policy response may be either to remove or ease these

constraints, or to accept that what is socially-acceptable is consumption of at least  $H^*$ , and that income supplements or price subsidies will be required even for those whose income is apparently large enough to afford both  $Y^*$  and  $H^*$ . These are cases where unaffordability is due to the presence of an additional non-income constraint. Therefore to determine which groups are suffering from unaffordability among those whose income is sufficient to purchase  $Y^*$  and  $H^*$ , but who are not actually consuming these quantities, requires separating those with 'perverse' preferences from those with other, non-income constraints. This would be virtually impossible. However, the more pervasive one believes these non-income constraints to be, the greater the proportion of those whose actual consumption is in area C or D, but outwith the triangle  $OFG$ , should be allocated to the 'unaffordable' category. A good example of these cases is to be found with respect to the system of property rates. It was often argued that the rates system was unfair because there were people living in large houses facing high rates demands, but who had low cash incomes. Such people—principally elderly widows, living in their family homes, with no outstanding mortgage debt, occupying houses rather larger than  $H^*$ —faced high rates bills. However, the incomes of such groups were often small and thus they could not 'afford' to pay their rates bills. These are clearly examples of individuals in area C. They may be able to find the income if they reduced their housing consumption, but this may not be possible due to emotional attachments to the family home or the existence of imperfect capital markets. Opponents of the rates system relied heavily on this type of affordability argument.

So far, it has been concluded that these concepts of affordability are all concerned with opportunity-cost: how much income has to be given up to consume  $H^*$ , or how much housing has to be sacrificed to consume  $Y^*$ ? The definition represented in

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Figure 1 may be regarded as minimalist and likely to have few, if any, dissenters. Using other definitions brings with it some practical problems. Confining unaffordability to the triangle represented by the consumer's budget constraint (Figure 2) implies either assuming that all consumers face the same relative prices of housing and other goods, or else determining the prices which may be faced by each individual. It is certainly highly likely that individuals face different housing prices because the housing system is far from perfectly competitive. Because of the practical difficulties of disentangling the various impacts of differences in relative prices, income and non-income constraints and consumer taste, it might be argued that a broader definition of unaffordability should be used. Including anyone who is not actually consuming  $Y^*$  and  $H^*$  in the class of those experiencing unaffordable housing (Figure 4) will increase the size of the class considerably. However, this very broad definition is likely to attract criticism because it includes some individuals who could afford to consume  $H^*$  and  $Y^*$  but choose not to. The practical problem is to determine which individuals this applies to. The solution may be to cease to consider affordability as a dichotomous concept, and to accept that there are more difficult cases which constitute shades of grey.

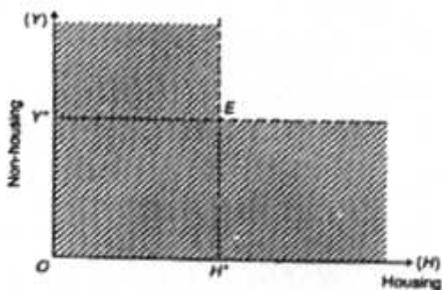


Figure 4. A broader definition of affordability.

### Ratio Measures

Although the definitions of MacLennan and Williams and Bramley are useful starting points in understanding the possible meanings of the concept of affordability, in practice, both authors use ratio definitions. A ratio definition of affordability, at any given set of relative prices of  $Y$  and  $H$ , can be represented as a ray through the origin of Figure 5, such as  $OJ$ . The slope of the ray depends on both the specified ratio of housing costs to income and the relative prices of the two goods. Any point on the line represents combinations of housing costs relative to incomes which are equal to the target ratio. Any point above the line represents a ratio of housing costs to incomes below the prescribed level and indicative that housing costs are not an 'excessive burden' on incomes. Any point below it represents a ratio in excess of the 'reasonable burden' and proof that housing costs are unaffordable, in the terms of the definition. In order to make comparisons between this definition, and those discussed above, the ratio line has been chosen as that which would pass through point  $E$ , representing consumption of both  $Y^*$  and  $H^*$ . It is now possible to expose the logical flaws in a ratio definition of affordability.

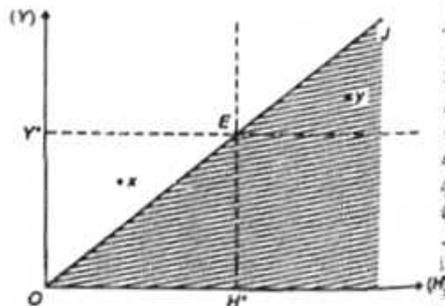


Figure 5. A ratio definition of affordability.

At levels of money income less than that represented by the line  $FG$  in Figure 2, a ratio definition defines area  $OFG$  as indica-

tive of affordability of housing. But it has already been argued above that, if society is concerned about consumers achieving a minimum standard of consumption of both housing and non-housing goods and services, then consumption patterns in this area are indicative of unaffordability, because they involve the consumption of either insufficient housing and non-housing, or the consumption of insufficient housing. There are other problems. The unshaded portion of region D in Figure 2 has been argued to require further information about preferences and constraint before it can be determined whether consumption in this area is unaffordable. However, the ratio definition classifies this area as unambiguously affordable.

There are similar classification differences on the other side of the line. The unshaded portion of area C in Figure 2 represents another ambiguous area on other definitions of affordability. However, the NFHA/Maclennan and Williams definition classifies this as being in the unaffordable region. The ratio definition also classifies consumption in region B below the ray  $OH$  as being evidence of unaffordability of housing. However, people in this region are consuming more than the minimum standards of housing and non-housing which, on all the other definitions, is proof of affordability. The problem arises because a ratio definition says nothing about what might be an acceptable opportunity-cost of that which is being consumed. Any statement about affordability has essentially to be a statement about opportunity-cost. If the state wishes to take a view about the affordability of housing, then it has to specify what opportunity-cost it considers excessive. The value of the foregone goods and services is measured in terms their total cost, and not in terms of the fraction of consumers' incomes absorbed. It therefore makes little sense to define affordability in terms of the ratio of housing costs to incomes if it is believed that opportunity-cost is important. In a ratio definition, it is

possible for individuals to be consuming very little of either housing or other goods and for their housing costs still to be considered affordable (see also Maclennan, Gibb and More, 1990). In order to illustrate the differences between the ratio definitions and the others, it is useful to consider the cases of individuals whose consumption patterns are represented by points  $x$  and  $y$  on Figure 5. Individuals at  $x$  are experiencing affordable housing on a ratio definition. However, they are consuming less than the socially-acceptable minimum standards of consumption of both housing and other goods. On the other hand, individuals consuming at  $y$  would be judged to be experiencing unaffordable housing costs on a ratio definition, and hence be an object of social concern. Any yet, these individuals are unambiguously better-off than those at  $y$  in that they are consuming more of both housing and other goods and services. These individuals are also consuming more than  $Y^*$  and  $H^*$ .

#### Official Definitions

The concepts of affordability represented by the British social security and Housing Benefit system can also be analysed in the terms just discussed. The Income-Support-scale rates could be argued to constitute a 'poverty standard' for the consumption of other goods and services, since the housing costs of those on Income Support are met by Housing Benefit. However, the Housing Benefit system does not set down minimum standards of housing consumption: Housing Benefit is not a housing policy, but rather a part of the social security system, and owners receive very little support from the Housing Benefit system for their housing costs, unless they are in receipt of Unemployment Benefits, or other state benefits. What the Housing Benefit system does do is to provide for the questioning of excessive housing costs for the needs of the household, either because of high costs per unit of housing service

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being consumed, or through over-consumption of housing. The implied definition of unaffordability represented by this system is shown as a shaded rectangle in Figure 6, where  $H_{max}$  represents the point at which the state considers excessive consumption of housing is reached.

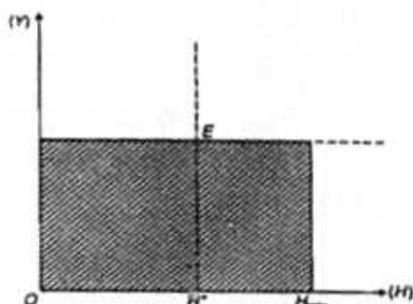


Figure 6. 'Official' definition of affordability.

It is interesting to compare the groups likely to be experiencing unaffordable housing on the implied official definition with the rather more generous definition of Figure 4. The first point of contrast is that the state's definition implies that anyone consuming more than  $H_{max}$  but less than  $Y^*$  would be regarded as experiencing affordable housing, which differs from the definition suggested by Figure 4, and in practice, this is likely to be the area in which many would argue that affordability problems exist. The only people likely to be in this region are those not on Income Support, but who either through choice or through some non-income constraint are 'over-consuming' housing. They could be in receipt of Housing Benefit, although Housing Benefit will not be meeting their full housing costs. The elderly widows for whom the poll tax was introduced are likely to be in this area.

If, notwithstanding the official definition of unaffordable housing, it were argued that the definition offered by Figure 4 was more appropriate, than those consuming more than  $Y^*$  but less than  $H^*$  should be

added in to the total. People occupying this region may be under-consuming housing in order to have a higher standard of non-housing consumption. Most of those in this area are likely to be in the owner-occupied or private-rented sector, since they have more opportunities to adjust their consumption of housing below  $H^*$ , than do tenants of social-sector landlords. It could be argued that tenants of social-sector landlords are allocated housing which is of the socially-acceptable minimum standard, and so all will be to the right of the vertical line at  $H^*$ . Those not on Income Support may find that their housing costs leave them with less than  $Y^*$  to live on, and may therefore be experiencing unaffordability on both definitions. For social-rented tenants on 100 per cent Housing Benefit, housing costs are not really a problem, since meeting them has no opportunity cost in terms of  $Y$ -consumption for this group. Those on Income Support, unless there is a problem with take-up of benefit, should also have sufficient income to allow them to purchase  $Y^*$  and  $H^*$  if they are social-sector tenants, providing they are not homeless persons temporarily housed in bed-and-breakfast accommodation, which seems by common judgement to be of a lower standard than what society considers  $H^*$ .

The Housing Benefit and Income Support systems together, then, effectively treat housing cost as an item of expenditure about which the consumer has little choice. It is also worth noting that this definition on its own does not treat housing as a merit good. It is only the standards set by social-sector landlords which render housing a merit good for their tenants.

#### Measuring Affordability

To examine the prevalence of unaffordability of housing, four definitions of affordability are utilised. On a rising scale of generosity these are:

*Definition: 1:* A 'minimalist' definition,

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unaffordable

$$P^*H < P$$

*Definition:*  
responding  
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$$M - P^*Y$$

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$$M - P^*Y$$

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corresponding to Figure 1. Housing is unaffordable if:

$$P^h H < P^h H^* \text{ and } P^y Y < P^y Y^* \quad (1)$$

*Definition 2:* The 'official' definition, corresponding to Figure 6. Housing is unaffordable if:

$$M - P^h H < P^y Y^*, H \leq H_{\max} \quad (2)$$

*Definition 3:* A residual income definition with a minimum standard of housing consumption corresponding to Figure 4. Housing is unaffordable if:

$$M - P^h H < P^y Y^* \text{ or } M - P^y Y < P^h H^*, Y > Y^* \quad (3)$$

*Definition 4:* A more generous version of the definition corresponding to Figure 4, where  $P^y Y^*$  is set at 140 per cent of the Income Support applicable amounts, which is a figure suggested by some researchers (see for example, Church of Scotland, 1988) as providing a more acceptable minimal income after housing costs are deducted. Housing is unaffordable if:

$$M - P^h H < P^y Y^{**} \text{ or } M - P^y Y < P^h H^*, Y > Y^{**} \quad (4)$$

where  $Y^{**}$  is the amount of goods which can be bought at 140 per cent of the Income Support applicable amount,  $M$  is the income of the consumer,  $P^h$  is the price per unit of housing services,  $H$  the quantity of housing services consumed and  $P^y$  is the price of all other goods. In all cases it is assumed that  $P^y$  and  $P^h$  are constant across individuals. This means that it is possible to analyse expenditures in order to make inferences about variations in the quantities of  $Y$  and  $H$  among individuals.

#### Data

Evidence on the prevalence of the affordability, or otherwise, of housing according to these definitions are gathered from a household survey carried out in the Glas-

gow Travel-to-Work Area (TTWA) between July 1988 and June 1989. The survey was carried out as part of the Joseph Rowntree Foundation's programme of research into housing finance and housing subsidies. In the Glasgow TTWA the survey had a response rate of 66 per cent, and obtained information from 1564 housing groups on incomes, housing costs, housing quality and household circumstances. A detailed technical description of the sampling frame and questionnaire is published separately (Prescott-Clarke, 1990). Because of non-response bias, multiple dwelling units at an address and multiple housing groups at a dwelling unit, results have been re-weighted. The quality of the survey data varied according to questions. The major deficiency appears to be in the income data. Only a maximum of 868 responses—i.e. 55.8 per cent—were usable in any analysis involving incomes. Owner-occupiers were worst-affected, and the upper end of the income distribution appears to be less reliable than results from the lower end. However, the main focus of concern is the lower reaches of the income distribution in this paper, and so this is not a serious concern. Owner-occupier income data have been re-weighted to take account of the differentially-low response rate.

Five measurement issues remain. First, what is the appropriate unit of housing consumption (the individual, household, tax unit, housing group, etc)? Secondly, the analyses so far have all been conducted in terms of an individual, so what account should be taken of different housing and non-housing needs of different sizes and compositions of households (or housing groups, or whatever)? Thirdly, how should income be measured? And, fourthly, how should housing costs be measured? Finally, how may  $H^*$  and  $H_{\max}$  be determined?

#### The Unit of Analysis

The definition of the appropriate unit of analysis is by no means obvious or

straightforward. Most economic analysis begins from the point of view of the household being the appropriate unit. But households can be, especially these days, quite complicated housing and income-sharing arrangements, and it is difficult to know how far it is appropriate or even feasible to enquire into these in order to determine the degree of income-sharing. Probably the most prevalent problem concerns adult children living in the parental home. If these are considered to be boarders or lodgers, then it could be argued that their resources should not be counted as part of the resources of the principal part of the household, but presumably then the housing costs associated with the adult child should be discounted in the affordability calculation relating to the main household. Effectively, the question concerns whether adult children should be considered separate housing units. In the research reported here, the approach adopted was that housing groups were taken to be the unit of analysis. A principal housing group is effectively defined as:

Any adult (over 16) who is named on a title deed or a rental contract, together with any other adult living at the address to whom they are either married or with whom they are 'living as married'. (Hancock, 1990, p. 14)

This was modified slightly so that the housing group concept defines employed adult children living with their parents as a separate unit of analysis (Hancock *et al.*, 1991), but includes adult children who are unemployed or in full-time education as dependents of the principal housing group. Part of the reason for adopting the housing group as the unit of analysis is pragmatic: it reduces the number of people who have to be interviewed about their incomes—which is a subject on which, in any case, it is difficult to obtain accurate information. It should be clear from the above definition that other adults who do not have formal boarder or lodger status are deemed to be separate decision-units and

effectively disappear from the analysis. In the household survey which formed the core data for the research, no income data were collected on what may be called informal boarders and lodgers, although their numbers and ages are known. In some ways, this is a little unfortunate, since it means that questions of affordability and access to housing from these potentially-independent housing groups cannot be examined. However, the analytical usefulness of the housing-group concept is that it is the core housing group making the long-run housing-investment decisions which is the focus. The decision-makers are assumed to take into account the total number of consumers likely to be living with them when determining the scale of the investment decision. However, the resources from which they anticipate financing the investment are presumed to include only their own income plus any contribution or rent from non-dependent, non-housing group, household members.

#### *Measuring Resources*

Some of the debates about the measurement of affordability have concerned the appropriate measure of the resources of the housing group. For example, should income be gross or net of taxation? And what account should be taken of fluctuating incomes? Economic theory argues the merits of a very broad conception of income, which includes non-pecuniary incomes and expected future incomes as well. The most comprehensive definitions of income, such as the lifetime consumption opportunity set (Atkinson and Stiglitz, 1980), contain considerable measurement problems. The first problem is that of unobservable items of income—i.e. the items which enhance an individual's consumption opportunities, but which are not obtained or exchanged through the market. Unrealised capital gains and imputed rents are probably the most important items in this class connected with housing, but the values of leisure and DIY activities are

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also important sources of real income, and often difficult to quantify. Another problem with measures of long-run income concerns imperfect capital markets.

It might be argued that a measure of income akin to Friedman's permanent income is particularly appropriate to housing demand, especially housing investment decisions. The basic idea here is that, if there is no bequest motive, then over an individual's lifetime, permanent income will be the same as permanent consumption. Since consumption can be measured by expenditure, would it not be better to look at current household expenditures as an indication of the level of housing costs that could be sustained in the long run? In other words, might it not be better to look at housing costs in relation to the total expenditures of the housing unit? The main problems with using current expenditures as a measure of household resources is that of expectations which turn out to be wrong. Expenditures reflect both current and expected future incomes, and expectations can be wrong. It may also be that people are myopic about the future and undertake 'too much' debt in order to finance current expenditures. Thus, expenditures, although a better guide to expected incomes over the long term than a housing group's current measured income, can themselves be problematic. It seems quite likely that problems of myopia, difficulties created by unfulfilled expectations and access to capital markets on unfavourable terms are more likely to be experienced by those for whom housing affordability is most problematic. It seems reasonable to adopt a measure of resources, therefore, when examining affordability which most closely reflects the abilities of low-income earners to meet housing costs. Accordingly therefore, it seems most appropriate to examine the current annual monetary income of the housing group as the index of ability to pay for housing.

There remains the question of taxes and benefits. It is a better measure of a housing group's resources to examine their incomes

after National Insurance and income taxes have been deducted and after state benefits have been added. But what about the poll tax? In the period during which the household survey was carried out, the rates either still existed or were assumed still to exist in the survey questions. However, after it came into force, the poll tax should clearly be deducted from the housing group's income in order to obtain a measure of net disposable income. Housing Benefit, although it may be argued to be part of the system of income support and therefore should be added to income, is more appropriately regarded as a housing subsidy and therefore best subtracted from housing costs. This is because Housing Benefit is a tied benefit: receipt is contingent on the consumption of housing services and recipients are not free to spend the money on other items. Therefore, Housing Benefit is best treated as a subsidy because it alters the relative price of housing services for recipient households.

#### *Differences between Households*

A simple examination of differences in residual incomes between housing groups is an inadequate guide to differences in the affordability of housing because the value of  $Y^*$  and  $H^*$  will vary according to the size and age-consumption of the housing group: larger households need larger houses and bigger incomes to achieve the same welfare as smaller ones. And it is income in relation to the needs of the housing group which governs affordability. A primary determinant of the total needs of the housing group is obviously the number of people it contains. Thus it is possible to make a crude adjustment for differences in the size of housing group by working with income per head. However, this neglects two important sources of real income difference between different types of housing group.

The first source of difference lies in different costs for different types of individual. Thus it costs less to feed a child than

Table 1. Equivalence scales implicit in 1988/89 Income Support rates

Housing group type	Equivalence scale, 1988/89
One adult, aged 18-24, no children	0.78
One person, under 18 (if eligible) or Lone parent, under 18	0.58
One adult, aged over 24, no children or Lone parent, over 18	1.00
Couple, both under 18 (if eligible)	1.16
Couple, at least one over 18	1.54
+each child under 11	+0.32
+each child 11-15	+0.48
+each child, 16-17	+0.58
+each child, 18+	+0.78

Source: Child Poverty Action Group, 1989.

an adult. So, the cost of achieving a given level of utility will be lower for a housing group of two adults and two children than it would for one consisting of four adults. The second source of difference lies in the possibility of scale economies or joint consumption of housing or other services—e.g. of a bathroom, a television or a washing machine—which are possible for multi-adult households. The approach therefore is, given information about the number of people living in the housing group, together with the numbers and ages of dependent children, to calculate the number of 'equivalent adults' contained within each housing group and to work with measures of resources per equivalent adult.<sup>3</sup> The Income-Support-scale rates have embedded within them the government's implicit income-equivalence scales, since different scale rates are payable for children of different ages and for adults sharing. The scales embedded in the prevailing Income-Support system have been used to adjust the incomes of the housing groups in the household survey. Their values are given in Table 1. It should be apparent that a major advantage of using income per equivalent adult is that different households can be compared more easily.

Since larger housing groups tend to be those with higher incomes, adjusting net

incomes for the number of adult-equivalents contained in each housing group has the effect of making the distribution of incomes, and consequently of residual incomes, appear less unequal than the distribution of unadjusted incomes. Inter-tenure differences in average incomes are also smaller once adjusted for differences in equivalent adults per housing group. Table 2 shows the average income per housing group, the average income per adult-equivalent and the average number of adult-equivalents per housing group in the Glasgow case-study. Since owner-occupiers have larger households, the adjustment for equivalent adults reduces the differences between the mean incomes of owners and renters.

#### *Measures of Housing Cost*

Much of the affordability literature considers the measurement of housing costs (see MacLennan, Gibb and More, 1990). In the rented sector, the total cost of housing is more than simply rent payments, since arguably the rates—now temporarily replaced by the poll tax, which is not a tax on housing—and the cost of minor repairs needed to maintain the house should be included. But where should the line be drawn? What about heating costs? And commuting costs? In the present case, since we have already argued that the

Table 2. Average incomes and numbers of adult-equivalents by tenure, Glasgow TTWA, 1988/89

Tenure	Annual net income per housing group		Annual net income per adult-equivalent		No. of equivalent adults per housing group	
	Mean (£)	Standard deviation (£)	Mean (£)	Standard deviation (£)	Mean	Standard deviation
Council	4462	2600	2927	1607	1.67	0.94
Owner-occupied	11408	5055	6286	3115	1.99	0.87
Housing Association	4703	2600	2997	1959	1.71	0.89
Private rented	4074	2954	2982	1344	1.51	0.69
Glasgow TTWA	6681	4823	4011	2709	1.79	0.91
No. of cases = 582						

Source: Household Survey (Prescott-Clarke, 1990)

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Income-Support scale could be thought of as buying certain 'socially-defined' basic necessities, we can ignore fuel and travel costs. There may still be certain items included in rental payments which may be argued to be payments for items which it is not strictly correct to call housing services, such as payment for meals, and for cleaning of common stairs, for example. These are excluded from the calculation of housing costs.

The calculation of housing costs for the rented sector is comparatively simple and commands much more agreement than calculations of owner-occupiers' housing costs. Some discussions of affordability in the owner-occupied sector, or with the ability of renters to become owners are really concerned with loan potential—i.e. with the size of mortgage which could be obtained, given the incomes of the main wage-earner. This relies on building societies or customers being the judges of affordability of loans. However, it is not always clear that it is believed that this is done well, since such measures fail to take into account residual incomes, and the effects of changes in interest rates on affordability. Other measures sometimes used, as mentioned in the introduction, are measures of the financial costs of owning a house. In other words, housing costs are counted as the sum of mortgage repayments after deduction of mortgage-interest tax relief, local property taxes, repairs and maintenance, and any factor's charges which may be payable. Whilst this may be argued to give a good indication of the short-run costs of ownership, it is not an indication of the long-run ability of owners to finance owner-occupation. The main reasons for this are that, first, such measures fail to take into account the opportunity-cost of the owner's equity. The second concern about cash-flow measures of housing costs for owners is that they fail to take into account the benefit of capital gains in reducing the cost of ownership.

In theory, the housing costs of owner-occupiers should be measured by the user-

cost, which takes the opportunity-cost of equity, depreciation and the effect of capital gains into account, in addition to the mortgage repayments, local property taxes and the maintenance of the property. However, if the long-run measure of housing costs is taken, then for consistency, so should a long-run of income. On the other hand, if it is argued that unrealised capital gains are not very useful in reducing the cash costs of ownership, or that housing finance markets are imperfect and do not provide facilities for frequent equity withdrawal, then, once again, it might be argued that immediate cash costs of ownership are a better guide to affordability. Essentially, one is faced once again with the question of what affordability is concerned with. Is it a measure which takes account of cash-flow, or is it a measure which should be concerned with long-run viability? If it is argued that affordability should be concerned with the liquidity positions of households, are we then admitting that capital market failure or imperfections are the reason for state intervention, rather than housing problems, *per se*?

#### Determination of $H^*$ and $H_{max}$

It is not easy to determine what the socially-accepted minimum standard of housing consumption might be. The simplest idea is to adopt the Census definition of overcrowding, which admittedly captures only one dimension of the quantity of housing services being consumed—i.e. space. The Census definition of overcrowded accommodation is where there are more than 1.5 persons per room in a household, not counting kitchens and bathrooms. In the Glasgow Travel-to-Work Area in 1988/89, some 2.8 per cent of housing groups were living in overcrowded accommodation. The highest incidence of overcrowding was found in the private rented and housing association sectors (5.6 per cent of the housing groups in each). In a total of 1551 cases, only some

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2.6 per cent of local-authority tenants and 2.8 per cent of owners were found to be overcrowded on the Census definition. The determination of  $H_{max}$  is even more problematic. A revealed-preference approach was adopted. That is to say, the space standards enjoyed by those on full Housing Benefit interviewed in the Glasgow TTWA were examined to determine the maximum space standards apparently supported by the Housing Benefit system. This showed that on average there were 0.77 people per room (s.d.=0.36) amongst those on full Housing Benefit; the median value was 0.67, the minimum 0.20 and 90 per cent of housing groups were living at a density of less than 1.33 persons per room. Therefore a value of 0.20 was adopted for  $H_{max}$ . This may be a rather generous estimate of the official definition of unaffordability, however.

#### Affordability of Housing in the Glasgow Travel-to-Work Area

Table 3 shows the proportion of housing groups in each tenure in the TTWA in 1988/89 experiencing unaffordable housing according to each of the four definitions of affordability described in the previous section. The results for the two minor tenures must be treated circumspectly since they are based on small numbers of cases. However, they clearly show that owner-occupiers are the least likely to experience problems of affordabil-

ity, irrespective of definition. Since most housing groups (53 per cent in the TTWA) are local-authority tenants, compared with 41 per cent owners, 3 per cent housing association and 3 per cent private renters, most of those experiencing affordability problems in the area are council tenants. The overall proportion of those experiencing unaffordable housing rises quite steeply, the more generous the definition. The effect of a more generous definition is particularly marked amongst renters. The large rise in the prevalence of unaffordability between definitions 3 and 4 occurs because the distribution of income is such that many renters are clustered quite close to the poverty line implied by the Income-Support-scale rates.

Clearly problems of unaffordability are due to cash housing costs being high in relation to cash incomes. The problems faced differ between tenures, however. Owners, for example, face cash housing costs far higher than the residents of any other tenure, but because of their high incomes have the greatest residual incomes on average. However, there are also quite large intra-tenure differences. For example, the cash housing costs of the 17 per cent of owners who had, by 1988/89, bought their houses as sitting tenants of their local authority with a discount under the Right-to-Buy (RTB) legislation, were some 33 per cent lower than those of non-RTB owners. However, on average their incomes are much lower, and so the differ-

Table 3. Prevalence of unaffordable housing costs by tenure, 1988/89

Affordability definition at number:	Owners	Local Authority	Tenure Housing Association	Private-rented	Total
1	0.0	0.0	4.3*	0.0	0.1
2	5.5	9.5	12.5*	12.9*	8.9
3	8.5	11.8	14.1*	19.3*	11.1
4	9.0	20.0	21.6	19.2*	17.0

Number of cases = 783

\*Based on fewer than six cases.

Source: Household Survey (Prescott-Clarke, 1990)

ence in post-housing-cost residual incomes between the two groups is much smaller, at only 15 per cent less. The cash housing costs of private-rented tenants are also extremely high, in spite of evidence to suggest that the average quality of such accommodation is considerably lower than that of any other tenure (see Hancock *et al.*, 1991), which suggests that affordability problems may be due to high housing costs, rather than low incomes. Social-rented tenants have the lowest average cash housing costs, but also the lowest incomes on average.

It is perhaps reassuring to note that practically nobody is suffering from unaffordability of housing on the minimal definition. In other words, the current system appears to be ensuring that nobody consumes less than both  $H^*$  and  $Y^*$ . It is useful to analyse the distribution of unaffordability by definition in terms of the diagrams used above. Figure 7 shows the proportion of housing groups in the TTWA in each of the affordability areas. Of the housing groups, 8.5 per cent are consuming more than  $H^*$  but less than  $H_{max}$  housing and less than  $Y^*$  non-housing. Only some 0.5 per cent inhabit the area which may be characterised as over-consumption of housing by comparison with the official definition of affordability. A further 2.1 per cent of housing groups are under-consuming housing—i.e. are overcrowded—even though their non-housing consumption is 'adequate' for their needs. And 5.9 per cent of housing groups may be said to be experiencing unaffordable housing if the more generous measure of 'adequate' non-housing income is adopted. Overall, 83 per cent of housing groups in the area were not having affordability problems on any sensible definition at the time of the household survey.

It is interesting to determine the characteristics of each of these groups in terms of tenure and household type. There are some difficulties in doing this because of the small numbers of cases involved in some categories. Table 4 shows summary charac-

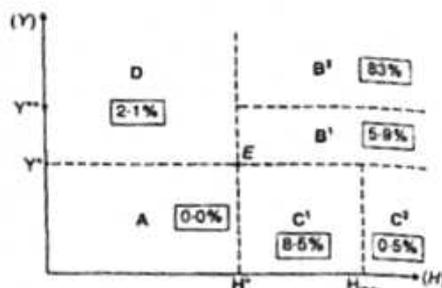


Figure 7. Proportion of housing groups experiencing unaffordability on various definitions.

teristics of the groups in each of the areas in Figure 7. Area C', which consists of those not overcrowded, but consuming less than  $H_{max}$  with a residual income which will not buy  $Y^*$ , assuming constant commodity prices across consumers, is disproportionately represented by local-authority tenants on Housing Benefit, without any labour market income. A high proportion of this group of the poor on even the government's definition are single parents or elderly households. A possibly surprising finding is the composition of the group inhabiting area C'. It seemed likely that it would consist mainly of owner-occupiers overconsuming housing either through choice or necessity, but in actual fact it contains mainly local-authority tenants, all of whom are in receipt of Housing Benefit, although none were on full Housing Benefit. Area D in Figure 7 contained no elderly or single-parent households, but consisted of mainly couples with children or 'other family' category housing groups. This reflects the predominance of owner-occupiers in this group.

There are also many council tenants on the margins of affordability. There is a slight overrepresentation of single parents among the group experiencing narrowly-defined affordability, but an underrepresentation of elderly households. However, both of these household types were over-represented among those who would be included in a more generous definition of

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Table 4. Characteristics of those with unaffordable housing, 1988/89

Characteristic	Area on Figure 7				
	C <sup>1</sup>	C <sup>2</sup>	D	B <sup>1</sup>	B <sup>2</sup>
Percentage Owners	17.7	0.0	76.9	2.2	30.2
Percentage RTB owners	3.0	0.0	20.0	0.0	6.2
Percentage council tenants	74.4	72.7	23.1	93.5	64.7
Percentage on Housing Benefit, of whom:	87.9	100.0	0.0	100.0	33.5
Percentage on Full Housing Benefit	92.6	0.0	0.0	0.0	2.4
Percentage elderly households	9.1	0.0	0.0	19.4	17.7
Percentage single parents	34.1	0.0	0.0	48.4	33.3
Mean net income per adult-equivalent (£) per year	1514	1514*	2962	4681	
(Standard deviation (£))	(646)	(646)	(781)	(644)	(2733)

\*Based on fewer than six cases.

Source: Household Survey (Prescott-Clarke, 1990)

affordability where the poverty standard is set at 140 per cent of the Income Support scale.

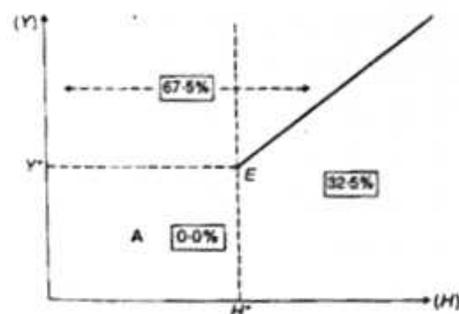


Figure 8. Proportion of housing groups experiencing unaffordability on a ratio definition.

For comparative purposes, Figure 8 shows the proportion of housing groups experiencing unaffordability on a ratio definition. The definition is selected such that unaffordability is only defined once consumption exceeds that represented by point E. Those with unaffordable housing costs are those for whom the ratio of housing costs to income exceeds 20 per cent—the proposed ratio of the NFHA. Almost one-third of housing groups, across all tenures, are in this category in the Glasgow TTWA. The composition of this

group is approximately three-quarters owner-occupiers and one-quarter local-authority tenants. Almost half of all owners have 'unaffordable' housing costs on this definition, and 71 per cent of those with unaffordable housing costs are in the top three deciles of the distribution of income per equivalent adult in the TTWA. It could therefore be seriously misleading, if the relief of poverty is a policy objective, to define unaffordability in ratio terms.

### Conclusions

This paper has examined a number of meaningful definitions of the concept of 'affordability' with respect to housing and has suggested that ratio measures have little value. Each of the useful measures proposed is likely to have its supporters and its detractors. The only definition likely to have universal acceptability, albeit as a minimum definition for many, in fact excluded virtually all the housing groups surveyed in the Glasgow Travel-to-Work Area in 1988/89. The most generous definition suggests that 17 per cent of housing groups in the area are experiencing unaffordable housing. Council tenants were disproportionately represented among these experiencing unaffordability on most definitions. However, owner-

occupiers' affordability problems were much more likely to be manifest in under-consumption of housing through overcrowding, whereas affordability problems of council tenants were much more likely to manifest themselves in low post-housing-cost residual incomes. This difference reflects the different constraints facing consumers in the two different tenures. A worrying finding is that there seem to be a significant number of council tenants whom the Housing Benefit system is failing, and a number who are falling completely through the welfare net. These cases merit further investigation although there are too few of them in the household survey to warrant much closer scrutiny.

Once satisfactory criteria have been established to determine what constitutes unaffordable housing, a number of policy issues remain. Different issues and remedies suggest themselves according to the definition of affordability adopted. The most obvious issue concerns the surprisingly large number of housing groups experiencing unaffordable housing on even the narrow official definition, the majority of whom are Housing Benefit recipients. The reasons for this deserve further investigation, although with different data from that utilised here because of the difficulties of disaggregation to small numbers of cases. This group is highly likely to be experiencing problems with the system of Income Support and Housing Benefit, due either to maladministration or take-up. Only a relatively small proportion of them appear to be owner-occupiers for whom the Housing Benefit system does not cover full housing costs. The much smaller group of mainly council tenants on partial Housing Benefit experiencing low residual incomes because of overconsumption of housing could be encouraged to move to smaller dwellings or take in lodgers. On the other hand, the group of mainly owner-occupiers who are underconsuming housing to maintain higher standards of post-housing-cost consumption may simply be engaged in temporary solutions to

short-run affordability problems, which may be of less public concern.

In spite of explaining that 'affordability' and 'affordable rents' are only distantly related, many may yet wonder how a definition of affordable housing can be used to determine an affordable rent. The answer is that any rent will be affordable which leaves the consumer with a socially-acceptable standard of both housing and non-housing consumption after the rent is paid. This narrows the range of possible rents only slightly, since presumably no-one would propose a rent structure which would leave all consumers with the same residual income after housing costs are deducted.

#### Notes

1. This deposit ratio is very high by British standards. In the household survey data in Glasgow, it was found that 49 per cent of first-time buyers (who formed 45 per cent of all buyers) put down no deposit on their current house, and that the mean deposit was 7.2 per cent. Amongst those who were not first-time buyers, the mean deposit was 27.7 per cent (see Hancock *et al.*, 1991).
2. It is also interesting to note at this point that the use of the term 'burden' in the MacLennan and Williams definition is somewhat ambiguous. In the taxation literature, when the term 'tax burden' is used, it usually refers to the average tax rate—i.e. the tax payment divided by the income. Therefore, a 'burden' could be taken to imply a ratio definition. In addition, the term 'burden' seems appropriate in the context of taxation and public expenditure, since tax revenue is raised to finance the provision of public goods—i.e. goods whose benefits accrue to large numbers of individuals at once. It seems less obvious that the notion of a burden is useful in describing the costs of consuming a private good—i.e. one for which the benefits accrue to the consumer. It is thus a term which seems to imply that higher housing expenditures have little or no benefit for the individual consumer, when, in practice, higher housing costs would buy the consumer more housing services.
3. In actual fact, the equivalence scales implicit in the Income Support rates are not

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constant from year to year. More detail on the theory and measurement of equivalence scales is given in Hancock (1990), Ermisch (1984) and McClements (1977 and 1978).

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