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The ownership and use of mobile telephones by Norwegians in 1999¹

By

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Abstract

This paper is an examination of the ownership and use of mobile telephones among a representative sample of 1898 Norwegians. The material comes from the 1999 SSB media use survey. The analysis provides insight into both the ownership and use of the system by various demographic groups.

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1 Introduction and method

This paper examines the ownership and use of the mobile telephone for private purposes in Norway in 1999. The paper is an examination of Norwegians' use of the device seen in terms of income, life phase and gender.²

The material was gathered in the 1999 version of Statistics Norway's annual media use survey. The survey included 1898 interviews with a random selection of Norwegians. The material was collected in quarterly interviews (March, June, September and December) among Norwegians between 9 and 79 years of age. The interviews were carried out on all days of the week, including Saturday and Sunday. In this way the material provides insight into daily use of various media. The material reported here is abstracted from the main database and examined using the standard background categories used in the survey.

Among other things, the material indicates that the ownership and use of mobile telephones is a dynamic situation. The group that has been most resistant to the technology is the elderly but one is also able to see gender and income based differences in access to and use of the mobile telephone. When considering payment, the preponderance of users pay for their own use. However, here again, there were differences.

Looking at the use of the device, the data indicates that men were more active users. The material also seems to indicate that there is a generation difference when considering the number of calls made and the time used on the telephone. Here teens of both genders are active users while this is not the case among those who are older.

The material also points out that the use of the all types of telephony for private purposes has risen in the period between 1995 and 1999. A closer examination of this material indicates that mobile telephony is perhaps responsible for this increased traffic. Thus, mobile telephony is not replacing fixed telephony but rather supplementing it.

A closer examination of these points will be made below. First, I will consider ownership of the mobile telephone and this will be followed by an examination of use issues.

² This material has also been presented in SSBs magazine called samfunnspeilet

2 Ownership

First, I will look at the use of the telephone for one's private affairs based on the data gathered in the 1999 SSB sample. This is the first year where data on mobile telephony has been gathered and so I will contrast the use of traditional fixed telephony and mobile telephony in this analysis.

2.1 Fewer people borrow mobile telephones and more own them

The first aspect of mobile telephone that will be considered is ownership. This is a rapidly changing area and the penetration into various groups in society has been

Age	Own	Borrow regularly	Borrow Irregularly	No access
9-12	18,7	27,7	14,3	38,4
13-15	41,5	21,3	16	20,2
16-19	66,1	17	7,1	8,1
20-24	77,2	8,1	2,2	12,5
25-34	67,3	13,1	5,9	13,4
35-44	63,5	20,4	8,1	8,1
45-54	63,5	19,2	5,5	11,9
55-66	55,7	12,3	8	24,1
67-79	38,8	4,8	5,3	50,2

Table 1 *Percent of the sample with access to mobile telephony by age in Norway, 1999*

changes in the actual penetration during the course of the year. In addition, the statistics reported elsewhere are often simply report the total number of mobile telephones as a percentage of the total population. In reality, however there are persons with more than one subscription and there are also mobile telephones that are associated with jobs and functions rather than individuals. Finally, there are also a certain number of "dead" subscriptions, particularly pre-paid subscriptions that have become inactive.

In addition to gathering information on ownership, I was also interested in other types of access to the mobile telephone. The data shows that 15,5% of the respondents could regularly borrow a mobile telephone and about half as many had irregular access. These were persons who perhaps access to a "household" mobile telephone that was pooled among several persons. Finally, slightly less than 20% of the population reported that they had no access to a mobile telephone.

The distribution of mobile telephones was, of course, not uniform across the Norwegian population in 1999. (See table 1) When examining ownership by the age of the respondent one sees that, in particular, the youngest and the oldest respondents lagged behind other age groups. The most dramatic change comes in the ownership statistic for teens. Among the youngest respondents, i.e. 9 - 12 year olds, 18,75% reported owning a mobile telephone in 1999. At the same time, this group reports the highest levels of borrowing on a "regular" and "irregular" basis. By contrast, the elderly, who also reported low levels of ownership, also report low levels of secondary access. One can interpret this as a general interest in the eventual ownership of

dramatic. In general, the group that has been the most immune to this technology is the elderly. In addition, one can see some gender and income based differences in the ownership of mobile telephones.

The data shows that in 1999 slightly more than 58% of the population owed a mobile telephone. This is somewhat lower than the levels reported in other sources. The difference can be accounted for in that the material reported here is gathered quarterly. Due to the rapid development in the market, there are

a mobile telephone on the part of the young teens, but not on the part of the elderly. The oldest respondents were that group reporting the highest levels of "no access."

As one moves up the age range from the youngest children to the teens and young adults, one sees a dramatic increase in the ownership. Indeed, the 20-24 year old respondents reported the highest ownership rates of all age groups. More than three of four persons in this age category reported owning a mobile telephone. Interest-

Age	Men	Women
9-12	17,9	19,6
13-15	36,7	46,7
16-19	77,4	57,9
20-24	85,7	68,2
25-34	85,5	51,9
35-44	79,5	48,5
45-54	79	47,7
55-66	67	44,3
67-79	55,8	25

Table 2 Percent of persons who own a mobile telephone by age and gender, Norway 1999

ingly, persons in this group also reported the lowest levels of secondary access. This points to the notion that the mobile telephone is increasingly becoming a personal as opposed to a communal item.

When considering age and gender, the data indicates that there are significant differences in adoption patterns for adult men and women (see table 2). If one considers the situation of the younger teen respondents, the data shows that there are no statistically significant differences between the genders. It is nevertheless interesting to note that girls adopt mobile telephones in larger numbers than boys in this age group. However, as one moves up the age range the differences become more pronounced. For those over the age of 25 almost 30% more men than women own a mobile telephone. Thus, while the teens, and in particularly the young teens show no gender based differences in their ownership of the

mobile telephone, the older groups hold onto a very pronounced gender based difference in the ownership pattern. One can suggest that the teen-aged girls will carry their affinity for the technology with them as they proceed into young adulthood. The data here seems to suggest that this is a likely possibility.

In addition to the gender and age based differences, the data also shows that there were different levels of mobile telephone adoption rates when considering different levels of household income.

Those respondents who lived a household with less than 200.000 kr. per year the reported the lowest levels of adoption where those living in households with over 600.000 kr reported the highest levels of adoption (47,2% and 65,1% respectively). Somewhat surprisingly, those persons living in households with between 200 and 299.000 Kr. income, i.e. the second lowest income group, reported the second highest adoption rate of mobile telephones. This is interesting in that, as we shall see, this group often paid for their mobile telephony from the household budget where the upper income groups often received a mobile telephone as a perquisite from their work.

2.2 Lower income people pay for their own mobile telephone use

The next issue to be considered is that of payment. The question to be considered here is who paid for the use of the mobile telephone subscription. The data shows that there are a variety of payment systems. Generally, payment by the user is the most common approach. More than half of those who had access to a mobile telephone indicated that they paid the bill themselves. If one only considers only those persons who owned the mobile telephone, more than two thirds of the respondents indicated that they paid for their own mobile telephone use. The analysis presented

below will focus only on those users who indicated that they owned their mobile telephone.

When considering the issue of payment by the age of the respondent, one sees that the very youngest users relied on others in the household for support (see table 3). This situation quickly changes, however. Among the 16-19 year olds, the more than

Who pays for the individual's mobile telephone use						
Age	Self	Self / Others in household	Others in household	Self / Employer	Employer	Total %
9-12	23,8	4,8	66,7		4,8	100
13-15	61,5	2,6	35,9			100
16-19	86,5		12,2		1,4	100
20-24	78,6	4,9	7,8	1,9	6,8	100
25-34	70,4	4,2	6,2	3,5	15,8	100
35-44	61,3	1,5	8,3	5,4	23,5	100
45-54	69,9		7,1	4,1	18,9	100
55-66	69,5	2,5	16,1	0,8	11	100
67-99	84	3,7	12,3			100
Gender						
Man	72,4	0,9	4,8	3,8	18,1	100
Woman	66,9	4,7	20,3	1,4	6,8	100
Income (Nkr)						
< 200	85,3	1,5	7,4	1,5	4,4	100
200 – 299	80,8	0,6	7,6	2,9	8,1	100
300 – 399	68,4	3,9	12,3	3,2	12,3	100
400 – 499	68,2	2,1	13,3	1,5	14,9	100
500 – 599	62,3	4,3	12,3	5,8	15,2	100
> 600	59,2	1	8,4	4,2	27,2	100

Table 3 Percent of persons with various forms of payment for their mobile telephony by age, gender and household income, Norway 1999

86% of the respondents indicated that they paid for their use themselves. This group along with the retired informants reported the highest levels of self-payment.

A relatively high percent of the middle aged mobile telephone owners reported that their employers paid for their mobile telephone use. The high point here was among the 35-44 year old users. Finally, very few of the respondents reported any form of "mixed" payment. The notable exception here is the "self / employer" category for the 35-44 year olds. Slightly more than 5% of the respondents indicated that they had this type of payment system. Thus, a large group of respondents in this age group had their mobile telephony at least partially or fully subsidized by their employers.

Now turning to gender one also finds that there were differences in the type of payment reported. The data indicates that men paid for their own use more often than

women. Indeed more than 25% of the women who owned their mobile telephone indicated that others in their household paid for at least a part their use. As one can see in table 3, 4,7% shared payment with others in their household and 20,3% indicated that others paid the entire cost of the mobile telephone. Almost three times as many men as women indicated that their employers paid for the use of their mobile telephone.

Finally, when looking at household income, the data indicates that as household income increases there is a greater and greater possibility that employers pay at least some of the costs associated with a mobile telephone. Only slightly more than 5% of the lowest income group indicated that they received any support for their mobile telephone use. By way of contrast more than 31% of the highest income group indicated that they received partial or complete coverage of these costs. Indeed more than 27% of the highest income group received complete compensation for their mobile telephone use.

2.3 Households with teens and young adults have the most mobile telephones

Up to this point, I have been examining the mobile telephone vis-à-vis the individual. Now I will turn to a short analysis of the mobile telephone within the household. In particular, I will examine the number of mobile telephones commonly found within the home.

Household income (Nkr x1000)	Number of mobile telephones per person							Total
	0	0,1–0,25	0,26–0,50	0,51–0,75	0,76–1,0	1,01–2,0	> 2,0	
< 200	49	2,1	18,3	3,5	24,5	2,4	0,3	100
200 – 299	28,2	6	34,9	7	21,5	2,1	0,3	100
300 – 399	20,9	14,2	36,9	11,9	13,4	2,6		100
400 – 499	15,8	15,2	36,9	11,9	17	2,7	0,6	100
500 – 599	9,3	18,2	40	16,4	14,2	1,8		100
> 600	10,2	18	36,3	19	14,2	2,4		100

Table 4 Number of telephones per person within the household by household income, Norway 1999 (*n* = 1697)

The data shows that 77,19% of the homes in Norway have at least one mobile telephone. The mean number of telephones within the home is 1,72. Further, the data shows that as the number of individuals in the home increases, so does the ownership of mobile telephones. The material shows that more than half of the single person homes reported that there was no mobile telephone in the household. This is a group that contains many elderly persons and also many women. From the analysis shown above one can see that this group is particularly resistant to the adoption of this technology. When seen in this context the result is not surprising.

Looking further, slightly more than half of the two person households reported having one mobile telephone. Almost one in four households of this type had no mobile telephones and the final 25% had two or more. In households with 3 to 5 persons the data shows that the preponderance had either one or two devices. This was a stable pattern with a small group of around 15% having none and 15 - 20% having more than two mobile phones.

If one looks at this data from a slightly more abstract level, i.e. the percent penetration within the home, one finds that on the whole about one third to one half of the persons in a typical household have a mobile telephone. This holds for all except the lowest income groups (see table 4).

Family phase	Mean mobile phones per household
9-24 live w/parents	1,84
Couple w/ child. 7-17	1,78
16-44 married w/o child.	1,46
Couple w/ child. 0-6	1,38
Couple 45-79 w/o child.	1,26
Single parent	1,09
9-24 single	1,06
25-44 single	1,01
45-79 single	0,56

Table 5 Mean number of mobile telephones per household by life phase, Norway 1999 (n = 1896)

Finally, the type of family structure provides insight into the purchase and use of mobile telephones at the household level. Those families with teen-aged children or with "mature" children living at home have the highest mean number of mobile telephones per household. Generally, persons in this type of household report that there are a more than 1,75 mobile telephones per household. The next most prominent group here is mature adults either without children or with small children. Single parents, young adults living by themselves and finally elderly individuals living alone round out this analysis.

2.4 Workers and independent business people own more often than others

The data shows that those respondents who reported being workers and also those who reported being independent business people reported the highest levels of mobile telephone ownership. The second tier of owners was among students and also upper level administrators.

Equal numbers of those who described themselves as being homemakers indicated that they owned or could borrow a mobile telephone.

3 Use

Beyond ownership of the mobile telephone there is the actual use of the device. In this section of the paper I will examine this both in terms of the respondent's estimates as to the number of calls made via the mobile telephone and in terms of the time used on these calls.

3.1 Men call via the mobile telephone more often than women

All respondents to the survey were asked how many private telephone calls they had made during the previous day. In addition, those persons who had access to a mobile

Number of calls	Type of terminal		
	Total	Fixed	Mobil
1-5	78,1	74,5	85,3
6-10	18	21,2	11,2
> 10	4	4,2	3,4
	100	100	100

Table 6 Percent distribution of private telephone calls per day by type of terminal

telephone were asked how many of these calls they made from a mobile telephone.³

Generally the persons who had access to a mobile telephone reported a mean of 3,42 private telephone calls per day when considering both fixed and mobile calls.⁴

Looking at only the mobile telephone traffic, they reported making 0,9 private calls per day. Further about 20% of the respondents indicated that they made no personal calls during a typical day when considering all types of telephony. The data also shows that more than 61% indicated the same

when describing their mobile telephony use.

The data indicates that the respondents were more intense in their use of fixed than with mobile telephony. The data shown in table 6 shows that almost three quarters of the respondents indicated that they had made or received 1-5 private calls per day via the fixed telephone. Slightly more than 21% indicated that they had made 6 - 10 calls per day. The corresponding results for mobile telephony show that more than 85% of the respondents who had made private calls via the mobile telephone called

	Mean number calls	
	Men	Women
Total	3,5	3,3
Mobile	2,0	0,7

Table 7 Mean number of private telephone calls per day by gender and type of telephone used, Norway 1999

1-5 times. Only 11,19% said that they had made 6-10 calls a day. This indicates that the respondents were more likely to use traditional fixed telephones more intensely than mobile telephones. This result is at least partially explained by fact that mobile telephony is more expensive than traditional telephony.

Men and women make about the same number of private telephone calls per day when all types of telephony are considered. However, the data also shows that men make significantly more mobile telephone calls than women. One can see from the material shown in table 7 that where men report a mean of 2,0 mobile telephone calls per day women reported a mean of only 0,7 calls. When looking at total telephony use, however, there are no statistically significant gender based differences. Thus, the data indicates that, in general, it is the males with access to mobile telephones that are the most enthusiastic callers.

³ It is more difficult to determine the number of calls received from a mobile phone since the situation of the caller is not immediately obvious.

⁴ When considering all telephone calls the respondents were not instructed to consider only those calls they made themselves. Thus they were free to count both incoming and outgoing calls.

Looking further at this, the data shows that in addition to the gender based differences in the number of mobile telephone calls; there are also age-based and occupational differences. Specifically, there are no significant differences in the mean number of private mobile telephone calls for the teenaged groups (See Table 8) nor are there gender-based differences for the retirees. However, for those between 20 and 66 each age group exhibits statistically significant gender based differences. If

Age group	Men	Women
9-15	0,8	0,6
16-24	3,3	1,9
25-44	2,3	0,6
45-66	1,2	0,3
67-99	0,2	0,3

Table 8 Mean number of mobile telephone calls by age and gender, Norway 1999

one considers, for example the 20 - 24 year old age group, the men made an average of 3,92 calls per day compared to only 1,49 for the women, a mean difference of more than 2,4 calls a day. The 25 - 35 year old group had a mean difference of almost two calls a day.

This data seems to point in the direction of a generation divide when it comes to the use of the mobile telephone. When looking at the number of calls made the data seems to show that teenage boys and girls have a similar attitude to the use of the device. However, as one moves into the older age groups, it is only the men that have started to go over to the

more mobile form of telephony. Tracking the changes in this type of data will help to isolate the cohort vs. the life phase aspects of the adoption of the mobile telephone. This is a theme that I will also consider in the next section on the use of time and the mobile telephone.

Blue-collar workers and students are the most active when considering the number of calls per day. They reported a mean of 1,8 and 1,5 mobile telephone calls per day respectively. Homemakers (0,5 mobile calls per day) and retirees (0,3 mobile calls per day) are at the other end of the scale here.

3.2 Women use the fixed telephone longer than men

The last portion of the analysis is the time used for making and receiving mobile telephone calls. In this section, I will examine the time use for all private telephony, fixed telephony and mobile telephony. One can see in Table 9 that on the average the respondents reported that they used more than twice as much time on the traditional fixed telephone as compared to the mobile telephone. Where the respondents reported that they used 24,0 minutes a day on the fixed telephone in private conversations they only used about 10,4 minutes on the mobile telephone.

	Mean minutes	N
Total	25,6	1385
Fixed	24,0	1375
Mobil	10,4	247

Table 9 Mean minutes per day for private telephone calls by type of telephone, Norway 1999

The data also shows that there are gender-based differences in terms of the time used on the telephone. This is true for traditional telephony but not mobile telephony. As one can see in table 10, men in the sample said that they used a total of just under 20 minutes a day for private conversations while women indicated that they used slightly more than 30 minutes.⁵ However, when it comes to the use of the mobile telephone there were only marginal differences.

⁵ These statistics are virtually the same as those reported in 1998.

If one looks at two-way interactions, the data shows that there are significant differences in the total time used on the telephone and also the time use for fixed telephony based on the age and gender of the individual. In this case the data from 1998 and 1999 shows that teen aged girls report the highest time use. Girls in the 13 – 15 year age group reported using a mean of 31,1 minutes per day while those in the 16 – 19 year age group reported using 32,4 minutes. The corresponding times for boys

	Mean minutes	
	Men	Woman
Total	19,8	30,5
Fixed	17,6	29,5
Mobil	9,9	11,3

Table 10 Mean minutes per day for private telephone calls by type of telephone, Norway 1999

were 12,0 and 21,1 minutes per day. Thus, the high water mark in terms of time use on the telephone comes during the teen years and is particularly obvious for girls. One will recall that when considering the number of calls the peak is associated with those in their early 20's and it is the males who report the highest use here. If one looks at the time use on the mobile telephone there are not any gender or age based differences. The male respondents reported using a mean of 9,9 minutes per day and the women reported a mean of 11,3 minutes per day.

3.3 Teens are calling more: Mobile and traditional telephony in the context

A final point is to examine the use of the mobile telephone in the context of the general use of the telephone. Data covering the number of private telephone conversations has been gathered from 1995 to 1999.⁶ In addition, during the last two years the respondents have been asked how much time they used for private telephone conversations per day.

The data shows that the mean number of calls per person has steadily risen since the middle of the 1990's. In 1996 the mean number of calls per day was about 2,2. By 1999 this had risen to 3,2. When looking for a cause for this rise one can examine the age of the individual where it becomes clear that all age groups have increased

Age Group	1995	1996	1997	1998	1999
9-12	1,2	1,1	1,4	1,5	1,3
13-15	1,6	1,8	2,7	3,1	3,2
16-19	2,3	2,4	2,7	3,3	4,5
20-24	2,6	2,9	3,1	4,1	3,9
25-34	2,5	3,1	3,0	3,0	4,1
35-44	2,5	2,2	2,5	2,8	3,2
45-54	2,1	2,5	2,4	2,4	2,9
55-66	2,1	2,2	2,4	2,2	2,5
67-99	2,3	2,2	2,3	2,2	2,7

Table 11 Mean number of private telephone calls per day by age for Norway, 1995 – 1999

the mean number of calls made. The teen and middle-aged groups have, however shown a particular increase in the mean number of personal telephone calls. In general those between 13 and 44 have increased the mean number of calls by more than one per day. However, those who are in the 16 to 19 year old age group have almost doubled the number of calls they

made from a mean of 2,3 per day in 1995 to a mean of 4,5 in 1999. This is a mean increase of more than two calls per day.

⁶ Between 1995 and 1998 there has been no data gathered on the use of the mobile telephone.

The data from the five-year period covering 1995 to 1999 also indicates that the gender of the respondent is of importance when considering the number of telephone calls (see table 12). The data shows that among the young teens the girls are perhaps slightly more active in terms of the number of telephone calls made. They quickly increase from about 1,5 calls per day to about 3 calls per day. This level holds for the groups up to age 35. The older groups of women reported about 2,5 calls per day. Thus, women who are in their middle age still report roughly the same number of calls per day as their 13-15 year old counterparts. The profile for the males is, however, somewhat different. After a somewhat slower start they reach a well-defined peak in the young adult years of about 3,5 calls per day. The middle aged and older groups are largely indistinguishable from the corresponding female groups.

The data for 1998 and 1999 implies the impact of the mobile telephone on the general number of private calls made by the respondents. There are significantly higher mean levels of calling among the teens and young adults. As we will see below, the mobile telephone enjoys a particular intensity of use among teens and young adults. The use of the mobile telephone became widespread among teens in 1998 after the introduction of pre-paid subscriptions. Thus, one can posit that this development is at least partially responsible for the general increase in the number of telephone calls being made.

To investigate this, it is possible to remove the effect of the mobile telephone on the data for 1999 and compare it to the mean number of calls per day for the period 1995 to 1997, that is the period before the wide popularity of the mobile telephone among

Age group	Male	Female
9-12	4,0	9,5
13-15	12,1	30,9
16-19	21,1	32,4
20-24	18,6	23,8
25-34	16,7	26,9
35-44	15,4	20,0
45-54	10,7	18,4
55-66	9,3	19,9
67-99	10,1	14,9

Table 12 Mean minutes per day for private telephone conversations by age group and gender for Norway, 1995 - 1999

teens and young adults.⁷ The data shows that there were a mean of 2.6 calls per day for the period 1995 to 1997 when considering all telephone traffic. By contrast, there were only 2.5 calls per day for 1999 if the reported number of mobile telephone calls is removed from the total number of calls. By doing this one can indeed see that not only does one lose the inflated traffic pattern shown in table 11 for young adults. In the case of young adults, aged 20 to 24 there is, in fact significantly less traffic in 1999 than in the 1995 to 1997 period if one removes the effects of the mobile telephone for 1999.

Thus, the mobile telephone is not simply an additional communication device for those situations when one is away from the telephone. Rather, the data seems to indicate that for teens and young adults, it has overtaken the role of the traditional telephone. This is not the case for the middle aged and elderly respondents where one sees virtually no differences in the mean calls per day when the effects

of mobile telephony are removed for the 1999 sample.

Turning to time use on the telephone for private conversations, we have access to data from 1998 and 1999. A comparison the two years shows that there has been virtually no change in the mean number of minutes used. In 1998 in the informants reported using 26,3 minutes per day while in 1999 they reported using 26,0 minutes.

⁷ There was obviously mobile telephone traffic during the period between 1995 and 1997. Unfortunately we are not able to control for this since the data is not available.

Looking further at this data one finds that women report using the telephone longer than men, (21,4 minutes per day for men vs. 30,2 minutes per day for women). There are also age based gender differences when considering the use of the telephone. (See Table 12) The data shows that in particular teenaged girls use the telephone longer than boys of the same age. The largest difference appears in the case of 13 to 15 year olds where girls report using the device for an average of 30,9 minutes a day where boys only report using it 12,0 minutes. This constitutes a difference of almost 20 minutes per day.

4 Conclusion

This paper has examined the ownership and private use of mobile telephony in Norway in 1999. The material, that is largely drawn from the 1999 media use survey of SSB, shows that mobile telephony is a quite dynamic phenomena. It has been quickly adopted by many sectors of society and is commonly used in everyday situations. Nonetheless the data also indicates that there are groups that are more resistant to the adoption of the device. Most particularly, this includes the elderly.

Teens are a particularly interesting group in this analysis. The material seems to indicate that girls are the quickest to adopt the technology and that generally teens are well represented among the owners of the device. In addition, teens are active users of the technology, indeed their adoption of the device has changed the way they interact and the way that they organize their social lives.

Looking further at the use of the mobile telephone, the material shows that there is a gender difference. The data shows that men are more active in their use of the device than women.

This analysis has examined mobile telephone use in the context of all telephone traffic. This examination seems to indicate that the mobile telephone is not replacing the use of the fixed telephone. On the contrary, it seems that the device is supplementing the earlier form of telephony by allowing people to communicate in places and at times that traditional telephony is not available.