

Where farmers' seek information when making purchasing decisions, implications for extension

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Abstract. When designing extension, it would be useful to predict where farmers are likely to seek information when making a decision. Towards achieving this goal, 40 farmers were surveyed when making a total of 60 purchases to test whether their level of 'involvement', or the importance of a product influenced how many sources of information they used. It was found that the higher the level of farmer involvement with the purchase, the more sources of information they used. Highly involving products were generally those that were expensive, novel or risky to purchase, such as farm machinery, and some livestock and consumables. Routine or low-risk purchases such as dog food and fertiliser were low involvement for most farmers and they sought little, mainly retail, information. The implications of these findings for the design and placement of extension material are discussed.

Key words: involvement, agricultural, decision making, extension.

Introduction

When designing an extension program, how does one select and justify the communication method or approach that will be most effective? No systematic, objective method exists to determine the nature and extensiveness of the information farmers may seek with regards to any specific technology (Fulton et al. 2003; Vanclay 2004), nor to determine where they will seek information when making decisions. Consequently, extension services are designed in an ad hoc manner, often based on practitioner experience, resources or organisational culture (Roberts and Gillard 2007).

Social psychology and marketing literature suggests that a consumers 'involvement', which reflects the importance of a decision to them, can be an accurate predictor of the type of decision-making, and information-seeking behaviour this person will use (Assael 1998). It has been argued that a farmer's decision to adopt an agricultural technology is similar to a consumer's decision to purchase a highly involving consumer product, as both entail financial, social and psychological risks (Linehan and Kaine 2003). Furthermore, many research innovations reach the market after a process of development and commercialisation, after which they are purchased, like any other products or technologies, by the farmer.

This paper presents the results obtained when levels of farmer involvement and information seeking in relation to the purchase of agricultural inputs were measured. We propose that this study could be a critical step towards developing an objective method to enable extension program designers and practitioners to predict what information farmers need and where they will seek it. Such a method may assist extension practitioners select the methods of communication and design placement of information, optimising the chances of the desired adoption outcomes being achieved. This paper is largely derived from a working paper by Hill and Kaine (2011).

Theory

Involvement

Involvement is a construct that relates how important a product or purchase decision is to a consumer. Involvement can be described in terms of a level or intensity. For example, someone may be highly involved in an issue or topic such as their family's health, or a hobby such as golf, or may find a product highly-involving, such as purchasing a house. Scales have been developed to quantify a consumer's level of involvement (Zaichkowsky 1985; Mittal 1995). A decision or product can be high involvement, meaning it is important to the consumer. This would lead to the consumer spending more time and effort making the decision, than they would on a low involvement, or less important decision (Assael 1998).

Involvement is intensified with the level of risk the consumer perceives the purchase contains, such as the risk of purchasing the wrong product (Laurent and Kapferer 1985; Dholakia 2001). This risk is reduced to the consumer with increased product experience and knowledge (Beatty and Smith 1987). Hence involvement influences the nature and extent of information consumers seek before purchasing a product or service (Laurent and Kapferer 1985; Beatty and Smith 1987; Assael 1998).

Levels of consumer involvement have been shown to be useful in predicting how much time and effort a consumer will devote to making a purchase decision and the extensiveness of their search for information to inform their choice (Laurent and Kapferer 1985; Beatty and Smith 1987; Assael 1998).

Decision-making processes

The concept of involvement is central to understanding which decision-making process a consumer will use when considering a purchase. Assael (1998) classifies consumer decision-making into four different types of processes depending on whether the product being purchased elicits high or low levels of involvement from the consumer, and whether the product is an infrequent or routine purchase (Figure 1). The value of this classification is that each of the four types of decision-making is associated with specific behaviours and information requirements. This then provides a basis for designing marketing, or extension activities, to support these behaviours and supply the required information.

Figure 1. Types of consumer decision-making

	High involvement	Low involvement
Infrequent purchase	Complex decision making	Limited decision making
Routinely purchased	Brand loyalty	Inertia

Source: modified from Assael (1998)

Complex decision-making

A consumer uses complex decision making, a process where the consumer searches for and processes information before making a decision, when purchasing a product or service that is highly involving (important) to them. Such products or services are novel or purchased infrequently, and can be important as they are complex, expensive, linked to self-identity and/or are associated with performance or other risks (Assael 1998). Typical high involvement purchases are homes, cars, holidays and perfume (Kapferer and Laurent 1993; Assael 1998).

Brand loyalty

Brand loyalty occurs when a consumer has formed a favourable attitude toward a brand; a name, term, sign, symbol, or combination of these that identifies the maker or seller of a product (Kotler and Armstrong 1999). The purchase under consideration must be highly involving to the consumer and entail risk. Brand loyalty results in repeated purchase of that brand over time (Assael 1998). By repeatedly purchasing a brand that has provided satisfaction in the past, the risk of mispurchase is reduced. Therefore the purchase decision is simplified and information-seeking is usually in relation to selecting product features or checking price or availability (Keller 2003).

Limited decision-making Limited decision-making is associated with the purchase of low involvement products and services (Assael 1998). Typically, low involvement is associated with routine, inexpensive purchases where the consequences of mispurchase are limited. A consumer may perceive that such routine purchase decisions may warrant an extra decision-making effort in response to the introduction of a new brand of product, if there is a change in the features of an existing brand, or the consumer desires variety. These changes may be enough to arouse mild interest and curiosity in the consumer and provoke some additional effort (Assael 1998, Kotler and Armstrong 1999). When using limited decision making a consumer will not initiate an extensive search for information, but will confine themselves to consideration and evaluation of a few brands. Such decisions can be influenced by the provision of information at point-of-sale.

Inertia Inertia occurs with products that are routinely purchased and are low involvement for the consumer. Such products are usually inexpensive everyday purchases. Many grocery products may not be involving for the producer and the purchase decision is made using inertia. Inertia is used when the product or service is so unimportant to the consumer that they wish to minimise the time and effort devoted to the purchase decision. Consequently, consumers will seek little if any information when making their purchase decision (Assael 1998).

In conclusion, four types of purchase decision processes have been identified. The use of these processes by consumers depends on the intensity of their involvement and our hypotheses are:

Hypothesis 1: Farmers are likely to follow the same four decision-making processes as other consumers when purchasing agricultural inputs.

Hypothesis 2: The decision-making process used by the farmers depends on their level of involvement in the process.

Information-seeking behaviour

Each of the decision-making processes described above: complex and limited decision making, brand loyalty and inertia, are associated with distinct consumer behaviour in relation to their search and need for information (Assael 1998). As the level of consumer involvement in a product or service increases so does the amount of information they require to make a decision. Hence, the effort consumers devote to searching for information increases with increasing involvement (Beatty and Smith 1987). This leads to *Hypothesis 3:* Farmers use more sources of information when making high versus low involvement decisions.

Measurement of the extent of information seeking is generally conducted with respect to the *source* and *amount* of information (Beatty and Smith 1987). Beatty and Smith (1987) classified sources of information into interpersonal, neutral, retailer and media. To this list Kempf and Smith (1998) added experiential sources of information, such as looking at the product in action or conducting a trial.

The amount of information a consumer will collect depends on a number of factors in addition to their involvement with the purchase. One is prior knowledge of the product or product class. If a consumer feels that they are already knowledgeable about a product class they are likely to require less information before they feel able to make a decision (Beatty and Smith 1987; Blodgett et al. 1995). People stopped searching for information when they felt a sense of comfort with the amount of information they had collected, felt they were not finding any new information, had become bored with searching, or ran out of time (Berryman 2008).

A number of studies have been conducted on farmers' sourcing of information to inform their decision-making and how they evaluate and make sense of this information (Vergot et al. 2005; Villamil et al. 2008). Others have studied farmers' use of individual sources or channels of information such as: interpersonal information (Ford and Babb 1989), the world-wide web (Spink and Hicks 1996), written information (Sutherland et al. 1996) and communication networks (Demiryurek et al. 2008). No agricultural studies were found that linked the concepts of involvement, consumer decision-making and information-seeking.

In conclusion we propose that a strong relationship exists between the level of involvement, type of decision-making process and the number of sources a farmer will use when making a purchase decision. We suggest that if there is a pattern to farmer information-seeking, it will be possible to predict their future information needs and likely search behaviour.

Methods

Measures

Based on the preceding discussion, it was decided that the principal variables to be measured by this research would be: the intensity or level of farmer involvement in purchase decisions; the type of decision-making process followed when making the purchase and the number of sources used. A questionnaire was designed to collect these data.

A number of scales have been published that measure levels of consumer involvement. We chose Mittal's (1995) modification of the Zaichkowsky (1985) scale, the Personal Involvement Inventory. This scale has shown adequate evidence of uni-dimensionality and internal consistency (Bearden and Netemeyer 1998), and being relatively short, was unlikely to fatigue respondents. Respondents were asked to rate their responses to the items in all of these scales using a five point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Some items were reversed to check for response consistency.

Statements were developed that described each of the four types of decision-making (complex decision making, brand loyalty, limited decision-making and inertia) proposed by Assael (1998). Respondents were asked to select the statement that best described the way they made their purchase decision. If none of the statements presented matched the consumer's attitudes or experience, they could select 'other' as an option.

Search effort was measured using a series of eleven questions to identify if the farmers used: retail (staff and agronomists), independent (fee-for-service consultants and agronomists, research and technical reports, technical experts), interpersonal (family, friends, other farmers), media (articles, newspapers, industry magazines, newsletters, advertisements or classifieds), and experiential (trailing or looking at the product in action). Information accessed using the web was classified according to its source (e.g. retail, media). Social media was not considered.

These questions were based on approaches used by Beatty and Smith (1987) and Blodgett et al. (1995).

The resulting questionnaire was piloted with 20 producers and the data analysed to test the reliability of the scales. Mittal (1995) reported a Cronbach alpha of 0.90 for the five-item Personal Involvement Inventory scale. Using SPSS (Pallant 2005), we obtained a Cronbach alpha of 0.81 when using the scales to measure farmer involvement in purchasing agricultural inputs. This indicates that the scales had a satisfactory level of internal consistency, one indication that they were accurately measuring the construct of interest.

Data collection

Sixty questionnaires were personally administered to 40 farmers from a number of industries including livestock and horticultural production, cropping and mixed-farming. Each completed questionnaire represented one agricultural purchase, mainly in relation to farm machinery, stock, stock nutrition, crops, fertilisers, herbicides or disease control products. The farmers were sampled opportunistically at field days and through local contacts, and were deemed eligible if they were the key decision makers of the agricultural purchases. Some farmers provided information on either one or two purchases. The farmers that completed the questionnaires managed properties ranging in size from 5 to 2000 hectares in northern Victoria and southern New South Wales.

Results

Involvement and type of decision-making process used

All four of the decision-making processes were selected by some of the participants as accurate in describing their purchase related decision-making. This provides support for Hypothesis 1: That farmers are likely to follow the same four decision-making processes as other consumers, when purchasing agricultural inputs.

Analysis of variance (SPSS; IBM International 2005) on the type of decision making and level of participant involvement shows that farmers using complex decision making reported significantly higher levels of involvement than for any of the other decision-making processes (Table 1). The participants surveyed that used inertia decision-making reported significantly lower levels of involvement, than when using other types of purchase decisions. Participants reported similar levels of involvement when using brand loyalty and limited decision. These results support Hypothesis 2: The decision-making process used by the farmers depends on their level of involvement in the purchase.

Table 1. Type of decision-making and level of farmer involvement

Type of decision-making	Number of purchases	Mean level of involvement*
Inertia	7	10.4 ^a
Limited decision making	6	17.3 ^b
Brand loyalty	19	17.4 ^b
Complex decision making	28	20.1 ^c
Total	60	

*Figures in the column followed by the same letter are not significantly different ($P = <0.001$).

All of the participants surveyed that purchased farm machinery used complex decision-making ($n=14$). Most of the participants used brand loyalty when purchasing fertiliser ($n=10$). Inertia was used when purchasing dog food ($n=3$). None of the participants used complex decision-making when purchasing pest control products (i.e. worm paste). The rest of the agricultural inputs (stock genetics, stock nutrition and herbicides) were purchased using a range of types of decision-making depending on the context of the farmer (i.e. heavy rains leading to new weeds growing and hence a change in herbicide selection), or to the range of purchases within a product class, for example when talking about stock nutrition decisions, the farmer may have been describing a routine purchase of stock pellets or the purchase of a truck of hay for cattle.

Decision-making and sources of information

Type of decision-making and number of sources When making low involvement purchasing decisions using inertia, most of the participants surveyed used only one source of information (Table 2). Those making more highly involving decisions using limited decision making or brand loyalty used an average of three sources. Most of the participants surveyed using complex decision-making sought information from three or five different sources. This provides support for Hypothesis 3: Farmers use more sources of information when making high versus low involvement decisions.

Table 2. Type of decision making and number of sources of information consulted by farmers.

Type of decision making	Number of sources					Average	
	0	1	2	3	4		5
Inertia	1	5	1	0	0	0	1.0
Limited decision making	0	0	1	3	2	0	3.2
Brand loyalty	0	4	3	6	6	0	2.8
Complex decision making	0	0	2	6	11	9	4.0

Type of decision-making and preferred sources of information Fisher's 2x2 Exact Test (Fisher 1954) was used to identify statistically significant differences in the sources of information used by farmers for each of the four types of decision making (Table 3). Those participants that were classified as using inertia generally used only one source of, mainly retail, information. When using limited decision-making or brand loyalty the farmers also used retail information, but also a mixture of information from other sources. When making complex decisions more farmers used more sources than when making other types of decisions. This makes sense as verifying information by obtaining it from a variety of sources is a defining characteristic of complex decision making.

Retail information was commonly used (in 91.7% of purchasing decisions). This is logical as the majority of the agricultural products are purchased through a retail outlet. Many farmers used more than one source of information, so Table 3 shows that in 14.3% of decisions made using inertia the farmers used experiential information, while 0% used media.

Table 3. Sources of information (%) used in relation to type of decision making.

	Inertia	Limited decision making	Brand loyalty	Complex decision making	Average use of source (%)
Experiential	14.3 ^b	0 ^b	15.8 ^c	53.8 ^b	31.7 ^c
Media	0.0 ^b	50 ^{ab}	42.1 ^{bc}	89.3 ^a	60.0 ^b
Interpersonal	14.3 ^b	66.7 ^a	63.2 ^b	96.4 ^a	73.3 ^b
Independent	0.0 ^b	100 ^a	52.6 ^b	67.9 ^b	58.3 ^b
Retail	71.4 ^a	100 ^a	100.0 ^a	89.3 ^a	91.7 ^a

Note: Cells in the same column containing different letters are significantly different at $P < 0.05$

Level of involvement and sources of information used Given that differences in search effort arise from different types of decision making, a Generalized Linear Model was applied to identify significant differences in the probability that respondents would seek information from different sources depending on their level of purchase involvement (GenStat, VSN International 2010). The results are summarised in Figure 2 and Table 4.

The results show that, except for retail information sources, there was a statistically significant ($P < 0.05$) relationship between level of involvement and the likelihood of obtaining information from each source, adding support to hypothesis 3. The greater the farmers' involvement in a

purchase decision, the more likely they were to obtain information from a variety of sources (see Figure 2).

Figure 2. Level of involvement (cumulative score) and probability (%) of the farmers surveyed using an information source.

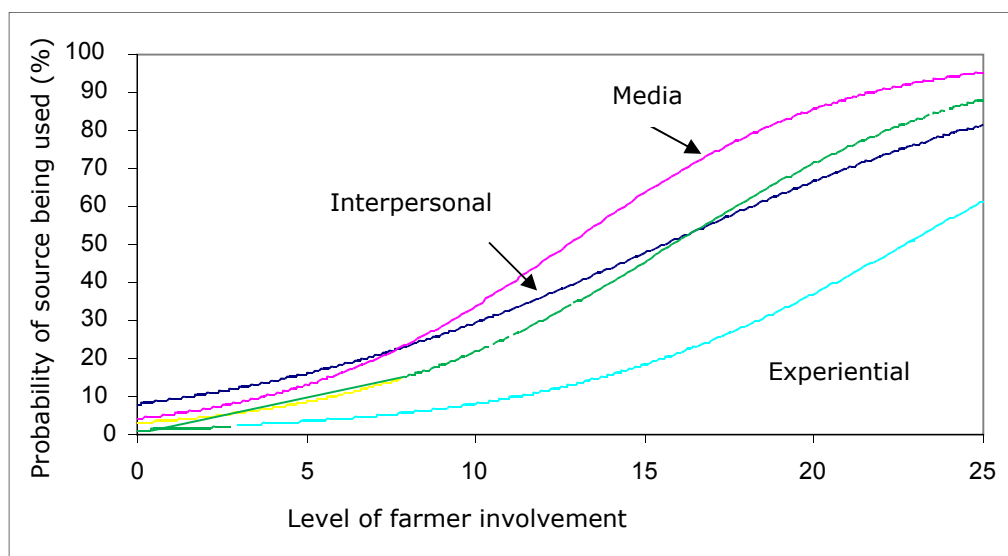


Table 4. Parameter estimates for the relationship between involvement and sources of information

Source of information	F-value	Intercept	Slope
Experiential	6.52*	-4.41*	0.19*
Media	10.72*	-3.46*	0.22*
Interpersonal	14.24*	-3.12*	0.25*
Independent	5.67*	-2.44	0.16*
Retail	0.01	2.53	-0.01

Note: An asterisk denotes statistically significant ($P < 0.05$).

Discussion

The results of this study provide support for the view that a farmer’s level of involvement in a decision will strongly influence the type of decision-making process he or she employs, and in turn where, and how much information he or she will seek when making the decision. By understanding, or better still, measuring which decisions are likely to be high and which low involvement, we suggest that an extension practitioner will have a solid basis on which to plan a program using the following guidelines derived from the marketing literature.

Extension for farmers making complex decisions

When making highly involving, risky decisions that are important to them and their farm business, such as the purchase of farm machinery, farmers use complex decision making. Complex decision making involves a systematic, often iterative process in which the consumer learns about the attributes of products and develops a set of criteria against which to evaluate the alternatives and select the most suitable brand or product choice (Assael 1998). This usually requires extensive information searching and processing, requiring a significant investment in time and effort (Beatty and Smith 1987).

There are a number of extension strategies that may be used to support farmers’ complex decision making. The first of these is to identify the key purchase criteria the farmer is likely to use, and gather detailed information about the characteristics of the alternatives in relation to

these criteria (Assael 1998). The provision of independent comparative information on alternatives is likely to be valued as this reduces the time and effort the farmer must invest in formulating purchase criteria and gathering information about the attributes of the innovation in relation to those criteria (Mittal 1989).

As farmers using complex decision making obtained information from a range of sources, a second extension strategy may involve coordinated information being disseminated through a number of sources. For example, a field walk and seminar (experiential, interpersonal and independent sources) demonstrating a new practice or crop could be supported by the provision of more detailed technical information and data accessible on the web or as printed material.

Media and retail channels can be effective in raising awareness of an innovation as farmers engaged in complex decision making may be expected to be constantly scanning for information that signals the presence of new products and services offering substantial benefits of the kind they are seeking. However more detailed information is then likely to be required.

Farmers surveyed in this study also sought experiential information. We suggest that extension efforts providing opportunities for farmers to view and experience the technology or practices being extended, through methods such as field days, demonstrations and trials, will be valued. Overall, there is a valuable role for extension to influence complex decision-making through the use of media, being an independent source of information and providing opportunities for experiential learning through trials, demonstrations and farm walks.

Extension for brand loyalty-based decisions

In this study, we found a number of farmers loyal to their fertiliser and chemical brands and suppliers, and as expected, farmers using a brand loyalty process, consulted fewer sources of information when making a purchase decision than those using complex decision making. This is consistent with marketing theory that suggests that brand loyal consumers, provided they are satisfied, will make decisions to re-purchase based on targeted information about the availability, features or pricing of their preferred product or brand (Assael 1998). The search for this information tends to be confined to trusted sources of advice; product and service suppliers, family, friends, other farmers and consultants (Keller 2003).

If farmers are brand loyal to a product it is difficult to change this attitude unless they become dissatisfied, or the new offering provides significant and obvious advantages over its predecessor (Assael 1998). Keller (2003) suggested that consumers can also show loyalty to a person, technology or a series of ideas. It is possible that farmers are brand loyal to a particular rural supplier and their agronomic advisers, or to a consultant, in effect drawing on the learning and knowledge of credible sources to make a sound purchasing decision (Assael 1998).

There are two implications here for the design of extension services. Firstly, an extension service is more likely to be consulted and valued by farmers if it can engender and maintain their loyalty. Engendering and maintaining loyalty requires a commitment to relationships with individual farmers, and a commitment to training, staffing and resourcing (Quester et al. 2010). Such a commitment may be difficult to execute in a public extension agency. Secondly, it may be possible to disseminate information through suppliers or consultants to whom the farmers are loyal. However tensions may arise if the information to be disseminated (such as product comparisons) does not align with the commercial interests of the supplier.

Extension for farmers using limited decision making

The farmers in this survey sought information from an average of three sources when using limited decision making. However theory suggests that it is unlikely the information they sought was particularly detailed, comprehensive or complex. Extension of products or practices that are likely to be made using limited decision making can be done at point of sale (information sheets, promotional offers) or through the media (advertising, simple, catchy messages with limited information).

Extension for low involvement decisions (inertia)

Consumers use inertia decision making when making routine, low risk purchases (Assael 1998). In this study we found that dog food was an example of an on-farm purchase where the farmers generally used inertia.

While generally extension programs aim to create or support more complex, significant changes on farm, there may be aspects of a desired outcome that can replace existing low-involvement purchasing or practices. For example, there may be a preferred mineral block or worm paste that delivers minor productivity or natural resource management benefits.

As farmers are unlikely to seek information prior to purchase, consistent with the results of this study, information is mainly sought from the retailer; the major opportunities to provide extension are at the point-of-sale (Assael 1998). Strategies may include bright, attention grabbing posters or flyers; free samples; or other promotional offerings. Low involvement purchases are also likely to be price sensitive. Therefore, purchase and trialling may be increased by the use of price discounting.

Another possibility is to increase farmers' level of involvement with low involvement purchases, thereby shifting their decision making toward complex decision making. Assael (1998) suggests that one method for doing this is to link the product or practice change to an issue that is highly involving for the consumer, for example advertising a brand of tyres as important in saving fuel.

Conclusions

The results of this study support the hypothesis that the farmers' level of involvement in the purchase of agricultural inputs determines the type of decision process they employ, which in turn influences their information-seeking behaviour. Consequently, farmers' purchasing decisions are not idiosyncratic, rather there is a degree of structure and therefore predictability in the type of decision making they employ to purchase products and services, and the consequent effort they devote to gathering information about the purchase. This knowledge enables us to not only determine where, but why and when farmers will seek information. We suggest that this will become a powerful tool in assisting extension professionals to predict, design and position information to more effectively meet farmers' information needs.

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