How House Burglars Decide On Targets:
A Computer-Based Scenario Approach

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This chapter reports the results of a study of how a sample of burglars recently released from prison in Melbourne, Victoria in the late 1990s went about their business. Specifically, the focus was how these offenders selected and processed information about potential houses to break into using a series of case studies or scenarios presented on a computer screen, each scenario containing information on a range of cues which were features of the house or street that burglars in a previous study had reported were important in target selection (Macintyre, 2001).

The underlying rationale for the study was a desire to probe the utility of the rational choice perspective applied to burglary (Cornish & Clarke, 1986). The extent to which offences like burglary are planned and executed with careful attention to a reasonable range of potential risks and rewards was a subject of debate in the late 1990s (Cromwell, 1994; Hirschi, 1986; Rengert & Wasilchick, 1985), and remains a live issue today (Bernasco & Nieuwbeerta, 2005; Garcia-Retamero & Dhami, 2009; Nee & Meenaghan, 2006). In the ten years since this study was completed (in 2001) a number of detailed studies of burglar decision processes have been published. As we show in the next section, on the whole these studies support earlier research, highlighting the importance of factors such as familiarity, occupancy, visibility, accessibility, vulnerability and potential rewards as important when choosing a target. Features of the burglar, such as their age and experience and whether or not they were taking drugs have also been confirmed as influential. The study reported here traverses much the same territory as recent research but it used methods that remain, in our view, innovative and produced results that contribute new insights into burglars’ reasoning and decision processes.
Wilkins and Chandler (1965, p.22) advise that the key to good decision-making research is a method that constructs a situation “as near to that met in day-to-day work of the participants consistent with the need to obtain good information and controls.” The study’s technique was accordingly designed to balance the competing demands of tight experimental control with the need to simulate the ‘real world.’ One real world advantage of the interactive computer based scenario approach is that it affords participants a great deal of flexibility in terms of how much or how little information they select about a potential target, as well as the order of selection. This means that participants can stop after one or two pieces of information have been elicited, or persist until they find out nearly all there is to know about a dwelling. Not only does this allow for a comparison of experienced and novice burglars, a theme of a growing body of research (e.g., Clare, 2011), it permits the construction of decision trees that can shed light on underlying cognitive processes.

A second advantage of the computer scenario technique is that by incorporating different alternatives for each of the cues embedded in the scenarios, and by carefully varying the combinations of cue alternatives across scenarios, a richer picture can be painted of the decision process. For example, in one scenario a participant may select the cue ‘dog’ and be told that there is ‘no dog’. They may then ask about alarms, and be told that there is indeed one present in the house. This combination and order may be important both to the decision to burgle (or not), and to how many steps are needed to make a decision. In another scenario they may select the same cues in the same or reverse order but be told that this
time there is a dog present but no alarm. A comparison of the rated attractiveness of these targets could be instructive, as well as when the participant decides to stop asking for more information, although in the present study the comparison would be complicated – as it is in the real world – by the presence or absence of other attractors or deterrents such as whether people are at home or the apparent affluence of the occupants.

RESEARCH ON BURGLAR DECISION MAKING

Motivations for burglary include the need for money, social factors (such as gang membership, delinquent subcultures, peer approval, status), kicks, thrills, and rebellion, and boredom (Clare, 2011; Cromwell & Olson, 2009; Hearnden & Magill, 2004; Nee & Meenaghan, 2006). Cromwell and Olson do emphasize however that motivations such as thrills and rebellion are characteristic mostly of young offenders, and that on the whole burglary is a highly instrumental crime. Other researchers have noted the close link between burglary and heroin use (Farabee, Vandana and Anglin, 2001; Payne and Gaffney, 2012). In an Australian study Stevenson, Forsythe and Weatherburn (2001) found that the most common method for adult burglars to dispose of stolen goods was by directly exchanging them for heroin.

In their formative study, Bennett and Wright (1984) found that burglars could be grouped into three categories: 7% opportunistic, 10% highly skilled, and 76% in-between. Nee and Taylor (1988) rated the burglars in their study similarly: 4% were opportunistic and spontaneous with low levels of skill,
12% were highly skilled as they conducted detailed planning and reconnaissance, and the remaining 84% were in-between. Maguire (1988) reported similar results, grouping burglars’ sophistication in regards to decision making under three headings: planners, those who select and inform themselves about a target well in advance; searchers, those who seek a suitable target and burgle it; and opportunists, those who are stimulated by an opportunity to steal.

Being a motivated burglar is not enough for an offence: a suitable target must also be selected (Cromwell & Olson, 2009). Recent research suggests that in most cases there is at least an element of opportunism in the target selection process, consistent with earlier research. For example Hearnden and Magill (2004) reported that fewer than a fifth of their burglars (14/73) had completely pre-planned their offences, the majority forming the intention to burgle but with details such as the precise target and methods to be used decided later. Nee and Meenaghan (2006) came to a similar conclusion: three-quarters of their burglars made the initial decision to commit a burglary away from the scene of the crime and then searched around for a suitable area until they found a target. Garcia-Retamero and Dhani (2009) explored the cues that burglars relied on and found that compared to police officers and graduate students burglars were more likely to rely on only one cue when choosing a target. This however may reflect either opportunism or experience, or indeed both.

The most common means of travel for burglary were walking and the use of a
car (Clare & Ferrante, 2007). Burglars generally do not like to travel far to commit an offence, and they like familiarity with a location, the ability to obtain money quickly, and practicalities if walking (Hearnden & Magill, 2004). However, Clare (2011) found that expert burglars compared to novices were more likely to travel over three kilometres to their target because of the risks associated with offending close to where they lived.

Cromwell and Olson’s (2009) study was innovative in that it combined interviews with burglars with recreations of their past crimes while the researchers observed and asked questions. Their burglars reported a higher degree of planning and analysis in the interviews than when they were taken back to their targets, the latter appearing to have been chosen more on the basis of opportunity than purposeful selection. Nevertheless it seemed that even if the offending was opportunistic burglars did go through some rational choice process. If they were presented with an obstacle such as physical security, dogs, or the presence of residents they were likely to move onto another target rather than deal with the impediment. “Burglars use three categories of environmental cues to assess these risk factors: (a) cues that indicate visibility of the proposed target site, (b) cues that indicate whether the target site is occupied, and (c) cues that indicate the degree of difficulty that might be expected in actually breaking into the site.” (p. 54).

Since the focus of the present study is how burglars select specific houses to break into there is value in reviewing what is known about the effects of specific cues, including those that fall into one of the categories identified by
Cromwell and Olson (2009).

Level of affluence and inside information

Many studies have found that cues that signify affluence, such as a well-kept garden, general upkeep and décor, or an expensive car in the driveway, were highly regarded by subjects (Bennett and Wright, 1984; Cromwell & Olson, 2009; Hearnden & Magill, 2004; Nee & Meenaghan, 2006; Wright & Decker, 1994). Affluence can also be determined through inside information, gained directly or indirectly. One fifth of Wright and Decker’s burglars chose to break into the homes of persons they knew, but Budd (1999) reported that more than half his offenders were either well known to the victim or were at least a casual acquaintance.

Alarms

Many studies have found that an alarm, or the obvious signs that an alarm is installed, has a deterrent effect on at least some potential offenders (Bennett and Wright, 1984; Cromwell, 1994; Netherlands Ministry of Justice, 1991; Wright, Logie and Decker, 1995). On the other hand, the majority of Nee and Taylor’s (1988) subjects (60%) stated that alarms were not a deterrent. Cromwell and Olsen (2009) reported that the likely presence of alarms or private security was one of the main reasons their participants chose not to burgle affluent targets, but if there were signs that the system has not been well implemented, or could be disarmed easily, offenders were not deterred.
(Hearnden & Magill, 2004). Garcia-Retamero and Dhami (2009) found that burglars (as the experts) were more likely to pay attention to the security of the property (or absence of it) than access.

Dogs

Hearnden and Magill’s (2004) burglars preferred not to deal with dogs as they could be regarded as a form of occupancy. Large dogs represented a physical threat while small dogs were often noisy, drawing unwelcome attention to the intruder. In general however the literature is divided as to whether dogs act as a deterrent (Bennett & Wright, 1984; Krainz, 1990; Nee & Taylor, 1988), although it seems clear that expert burglars are less likely to be put off (Clare, 2011). As a rough generalization dogs probably deter about half of all offenders, but a ‘beware of the dog’ sign appears to have little effect on decisions (Wright, Logie & Decker, 1995).

Signs of occupancy

Signs of possible occupancy such as a television, radio or lights on inside a house deter some offenders, particularly novices (Clare, 2011; Hakim & Buck, 1992; Nee & Taylor, 1988). Scarr (1973) and Maguire (1982) found that cues that signal a lack of occupancy were highly attractive and influential. Nee and Meenaghan’s (2006) sample of burglars would check a property for occupancy by knocking on the door, ringing the doorbell, looking for lights, or observing whether there was a car in the driveway or milk on the doorstep. Snook,
Dhami and Kavanagh (2011) compared the effects of eight cues: presence of vehicle, security system, windows above ground level, curtains above ground level, landscaping to hide behind, deadbolt, and attached garage. Whether a car was present was the most critical cue and was the most strongly related to occupancy. If a car were not present burglars would continue to evaluate the target until another cue would stop them. In Nee and Taylor’s study a small minority (12%) actually preferred a house to be occupied since there was more chance of valuables such as cash, jewellery, credit cards and cheque books being on site.

Locks and security

The majority of studies, including the benchmark study of Bennett and Wright (1984), conclude that locks are ineffective (e.g., Cromwell, 1994; Cromwell, Olson and Avary, 1991a; 1991b; 1993; Wight and Decker, 1994). Edgar and McInerney (1987) observed that the only deterrent effect a good lock may have is in how long it takes to defeat it, since a delay in gaining entry may increase the chances of detection. More recently Nee and Meenaghan (2006) reported that security cues were not as important as whether the property was occupied. Burglars in their study reported that the most common reason for abandoning a recent burglary was that they had been disturbed, not that they were deterred by insurmountable security. Cromwell and Olson (2009) do however make the important point that while the majority of burglars are not deterred by locks and security, they would prefer not to deal with them.
Visibility

Visibility refers to the extent that a house can be observed by neighbours and people passing by. It also includes the vegetation and physical structures that may obscure the sightlines of someone approaching a property. The less visible and more isolated a property the more vulnerable it is. Burglars like cover from shrubs and trees as breaking in and escape are facilitated (Bennett & Wright, 1984; Coupe & Blake, 2006; 2011; Garcia-Retamero & Dhami, 2009; Rebscher, 1990). By contrast, all the burglars in Nee and Taylor’s (1988) study expressed ambivalence about the effect of vegetation.

House location

Research has consistently found that a house situated on a corner is more vulnerable (Repetto, 1974; Taylor and Nee, 1988; Van Dijk, Mayhew and Killias, 1990). More generally, Bennett and Wright (1984) and Nee and Meenaghan (2006) found that burglars rated possible targets as more attractive if they had easy access and multiple escape routes, and that they preferred targets where reconnaissance and access could be via the rear of the dwelling. Hakim and Gaffney (1995) argued that properties that back on to wooded or deserted areas such as railroad tracks are preferred targets, partly because they have easy rear access.

Summary
Cromwell and Olson (2009, p.43) observe that “the concept of limited rationality proposes that for behavior to be rational, it does not have to be carefully preconceived and planned or require hierarchical, sequential decision making.” The literature on burglar decision making suggests that in fact offenders span the range of decision strategies, from the simplest single cue decisions made as an impulsive response to an immediate opportunity, to the carefully planned, deliberative and perhaps complex decisions of the knowledgeable veteran. Heroin using offenders may be no less capable of reasoned decisions than other offenders, especially since they are usually single mindedly focused on stealing money or goods and are frequently very experienced. Evidence on the effects of a wide variety of features of potential targets suggests that the perceptions and judgments of many burglars, especially those with more experience, differ from those of home occupiers or police, and that houses differ markedly in their attractiveness. Understanding better what drives these perceptions and judgments is the primary goal of the present study.

METHOD

Participants

Ninety-six participants were accessed through a private organisation that assists the reintegration of persons on release from prisons in Melbourne, Victoria, by providing short-term dormitory-style accommodation. All of the participants were male, experienced burglars, and heavy users of drugs, especially heroin.
The ages of the participants ranged from 16 to 29, with the mean a little under 20 years. Two participants had committed three break and enters (B&Es), which was the lowest number, while four participants estimated they had committed around 100 B&Es, the highest number. The mean was 33. Eight participants were in full time employment and 88 were unemployed. Nine of the participants were married or in a permanent de-facto relationship, while 87 were single. None of the eight who were employed were also married.

No financial incentives were offered to participants. There was some reticence and an expected level of suspicion from the residents in the early stages of the data collection. However, within a few weeks the presence of the researcher was accepted, thanks largely to longer-term residents vouching for the authenticity of the research project and allaying any fears voiced by prospective subjects.

Development of cues

This study design was restricted to an investigation of decision making in relation to breaking and entering alone into a private dwelling (house only) in the daytime. From the interviews conducted in the earlier study in Brisbane (Macintyre, 2001) and a review of the literature a list was constructed of all the main cues utilised by burglars in daytime house burglaries. Some cues (such as temperature) were not included because they are not mentioned often in the literature. Others, such as property marking (Wright, Logie and Decker, 1995), were not included because often a burglar has no awareness of them until he has entered a dwelling. Louvre windows were often mentioned as an attractor in the Brisbane interviews,
but were omitted from the cold-climate Melbourne experiment. The 17 cues utilized for the study and their alternatives are presented in Table 1.

**INSERT TABLE 1 ABOUT HERE**

Cue alternatives could act as a deterrent (e.g., dog present), but if an alternative did not act as a deterrent its effects could vary from neutral to being an attractor. Some cue alternatives merely stated that something is or is not present, such as cue 1 (dog): no dog; or dog barking loudly. Cue 17 (street type) was the only one that had four alternatives, the remaining cues describing two extremes, such as cue 6 (affluence): house looks expensive; or house is run down.

**Cue combinations**

A design consideration was that the information generated by the experiment about the influence of individual cues selected at different points in the decision process should ideally be maximized. If, for example, one alternative for a cue was always present when a specific alternative for another cue was also present it would be impossible to know which alternative was having an effect on the attractiveness of a target. For this reason the cue combinations were constructed so that there was no significant correlation between pairs of columns in a 20 (cues) X 20 (scenarios) table where each cell contained a 1 or 0 to represent cue alternatives\(^1\).

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\(^1\) Cue 17 (street type) with 4 alternatives was represented by 4 rows, making 16+4=20 rows.
The combinations were created using the Solver command in Microsoft Excel, initially imposing a fully balanced arrangement with 10 ‘1s’ and 10 ‘0s’ in each column (scenario), where 0 represented the first alternative for each cue in Table 1. The restriction was that no correlation between columns could exceed 0.430, which was just under a significance level of 0.05. These constraints permitted solutions until cue 5 (occupancy - car in driveway) at which point the algorithm could not continue. When 12 ‘1s’ and 8 ‘0s’ in each column was allowed the Solver was able to complete the process, with the exception that 3/190 correlations were just significant, a rate considered consistent with the objective of reducing to a minimum repeat cue-alternative combinations across scenarios.

Computerized information board

Participants were presented with targets using a computerised information board format, facilitating the monitoring of their information acquisition. The computer program was written using HTML software and was loaded onto a notebook computer\(^2\). The 20 scenarios were presented via a series of screens on the computer. The participants could control the presentation of the screens and select as much or as little information as they wished in order to arrive at a decision. They were given two practice runs before commencing the experiment proper.

Procedure

All respondents were given the same instructions:

*It is daytime and you are on your own. Look at what is most important to you first, through to least important. Don’t look at things you normally would not consider. However, you can look at as much, or as little information as you need to. You can look at every item if you wish. Pretend you are actually committing a B&E. Go through the process you would use as if it were a real B&E. Look at as much or as little information you need to until you are set in your decision.*

For each scenario the computer displayed a list of the 17 cues on the first screen. The participants were asked to select a cue from this menu by pointing the cursor and then double clicking. They were then exposed to a second screen that revealed the alternative for that cue for that scenario. For example if the participant selected cue 1 (dog) from the menu, the second screen would present them with the alternative for that cue (dog barking loudly or no dog). On a third screen they were then asked to make a certainty judgment, that is a judgment about whether or not they would break into the dwelling. The judgment was made on a 100-point scale, with 100 representing complete certainty and a 0 indicating that a participant was extremely unlikely to break into the dwelling. After participants made a rating they were asked if they required more information. If they answered ‘yes’ they were returned to the first screen and were again asked to select another cue, this time with the cues that had already been selected displaying the relevant information. If they answered ‘no’ they were presented with the next scenario.
This process continued until all 20 scenarios had been examined and rated by participants. It was decided that there was no advantage in randomizing the order of scenario presentation, so they were presented in the same order for all participants\textsuperscript{3}. The program recorded a range of data: the number of the scenario; the total number of cues selected; the sequence of cue selection; the alternative presented; the rating made after each alternative was revealed for every selected cue; and the final rating.

RESULTS

As noted earlier, the mean number of B&Es committed by the 96 participants was 33.03 (SD - 28.53). Figure 1 plots the reported numbers of B&Es by the ages of participants. Four clusters of participants are apparent:

1. Over 25 years of age with more than 60 B&Es;
2. Between 21 and 25 years of age with fewer than 40 B&Es;
3. Under 20 years of age with fewer than 20 B&Es;
4. Under 20 years of age with more than 30 B&Es.

The older (\textgeq20 years) and younger (\textlt20 years) participants with a high number of B&Es were probably those who had used B&E as one of their main sources of

\textsuperscript{3} But see the discussion of Figure 2 below: randomization would have permitted clearer conclusions about the efficiency with which participants came to final decisions as the experiment progressed.
income. In contrast, those who had a low number of B&Es were probably only part
time burglars. Figure 1 shows that the number of B&Es is not just a simple
function of age, with some participants under 20 reporting many more burglaries
than those much older.

Cues selected

Figure 2 presents the total number of cues selected for each scenario. One might
have expected that participants would choose a large number of cues for the first
few scenarios until they became accustomed to the process, after which fewer cues
would be necessary to reach a final decision. Figure 2 shows that this did occur
to some extent, but not in a simple way.

FIGURE 2 ABOUT HERE

Across the 20 scenarios the mean range was 3.54 to 5.68 cues to reach a decision.
Adding over the 96 participants the lowest number of cues selected was 344 for
scenario 9 and the highest was 545 for scenario 11, both scenarios occurring
around the middle of the presentation. Although a slight downward linear trend is
apparent in Figure 2, the pattern is more like a sine wave with diminishing
amplitude, with a definite levelling out apparent for the last 7 scenarios.
Unfortunately the decision not to randomize the order of presentation of
scenarios means that it is difficult to decide whether this levelling out reflected
features of those specific scenarios or was a result of participants settling on a
standard heuristic by that point in the experiment.
Table 2 shows the number of times a cue was selected, regardless of order. Each cue could have been selected a total of 1,920 times (96 participants x 20 scenarios). Cue 3 (alarm) was selected 1,538 times. This was the highest selection rate (80.20%). The least selected was cue 11 (garden) which was chosen 106 times (5.52%). The last column shows the relative popularity of all cues. Six cues - cue 1 (dog), cue 3 (alarm), cue 4 (occupancy – lights /TV /radio), cue 5 (occupancy - car in driveway), cue 13 (people in the street) and cue 16 (inside information) - accounted for 67.8% of all selections made.

For any scenario the most cues selected was 14, which occurred on 17 occasions. No participant ever selected all 17 cues to make a final decision. The minimum number of cues selected to reach a final decision was one, which occurred on 282 occasions. Single selections involved mainly cue 3 (alarm: n=141) and cue 16 (inside information: n=138). In 88% of 1,920 scenario assessments participants required 7 or fewer cues to reach a final decision.

The effects of age and experience

Figure 3 shows that there was a negative linear relationship ($r = -0.43$, $p<0.01$) between the total number of cues a participant needed to reach a final decision and the estimated number of B&Es they had committed. The more B&Es a person had committed the fewer cues they used, suggesting that the more experience one has
as a burglar the more selective one becomes with information.

**INSERT FIGURE 3 ABOUT HERE**

Inspection of the relationship between age and number of cues selected did not throw a great deal of extra light on the role of experience. Participants younger than 20 divided into two groups reflecting the two clusters of young offenders identified in Figure 1. Inexperienced young burglars required more than 120 cues to reach their decisions, whereas the more prolific offenders required fewer than 90. The oldest and by far the most experienced group (26-29 years) required the fewest cues, selecting less than 50 in total. Experience – with the skills it brings – seems more potent as an influence on the decision process than youth, despite the risk taking proclivities and greater impulsiveness of the young.

**First cue selected**

An important question is what cues were most frequently selected *first*, since this would imply a higher level of importance in the decision process. Table 3 lists the cues in descending order of popularity for first selection. Cue 16 (inside information) was apparently perceived to be the most important, being selected first most often. In fact from Table 2 we can see that of all the times it was selected (737) cue 16 was only requested second or later 5.8% of the time, and as we saw earlier in 138 assessments it was the *only* cue selected. Four cues - cue 16 (inside information), cue 3 (alarm), cue 1 (dog) and cue 13 (people in the street) - accounted for 91.77% of all first selections.
However, these four cues were not the four most selected *in total*. Cue 16, cue 4 (occupancy - lights/ TV/ radio) and cue 5 (occupancy - car in driveway) were selected approximately the same number of times, but cue 4 was only selected first 13 times and cue 5 first 38 times, compared to the 694 first selections for cue 16. A number of cues were selected many times, indicating their importance to the burglars despite the fact that they were rarely selected first.

Deterrent and attractive cue combinations

Table 4 shows the properties of the five most chosen cues in the 10 scenarios that received the highest mean final ratings (that is, where the target houses were judged most likely to be burgled). A tick symbol in a cell means for that cue/ scenario combination the deterrent alternative was absent. Scenarios 7 and 17 were the only ones that had the attractive alternative for the five most chosen cues, and significantly these scenarios had the highest mean final ratings (80.89 and 86.98).

Table 5 parallels Table 4 but this time for the 10 scenarios that received the lowest mean final ratings, with a tick symbol indicating that a deterrent alternative was present. Cue 16 (inside information) was not included in Table 5.
because there was no deterrent alternative for this cue. Table 5 confirms that when the deterrent alternative was most often present the mean final rating was lower, indicating that the house was judged as unlikely to be burgled. Scenario 8 was the only scenario where the four most chosen cues had the deterrent alternative, and not surprisingly this scenario received the lowest mean final rating (17.50). Similarly scenario 10 and scenario 18 were the only two with three of the four deterrent alternatives, and these received the next lowest mean final ratings (20.47 and 19.48 respectively).

TABLE 5 ABOUT HERE

The most striking feature of Tables 4 and 5 is that the 10 least attractive scenarios all had an alarm, while none of the 10 most attractive did. Overall, cue 3 (alarm) was the most frequently chosen and it was chosen first the second most often. Clearly alarms loomed very large in the decision making of the participants. None of the remaining 16 cues were as clear in their effects.

Number of cues selected

There was a positive linear relationship (r = .564, p< 0.01) between the attractiveness rating and the number of cues needed to reach a final decision. This suggests that the participants were easily deterred by a few negative cue values, but when the first few cue choices were not deterrent alternatives the participants selected more cues to be sure of their decision.
A DECISION TREE

It was noted earlier that an advantage of the design employed in this study is that by incorporating different alternatives for each of the cues, and by varying the combinations of cue alternatives across scenarios, a richer picture can be painted of the decision process. One way of educing the sequences of decisions that were used by participants, in a fashion that is clearer than has been possible with the analyses reported so far, is to represent them in branching diagrams or decision trees.

Figure 4 shows a portion of a decision tree that grew from cue 16 (inside information) when it was the first cue selected and the alternative was “From a reliable source you are told there could be a large amount of cash kept in the house.” Figure 4 aggregates the decisions of all participants across all 20 scenarios, so the ‘n’ at the bottom of each box refers to the number of selections, not the number of participants. There is also an identification number in brackets at the top of every box and circle.

FIGURE 4 HERE

To illustrate how to read the diagram, Boxes 1-15 are described briefly. Box 1 shows that on 694 occasions participants chose cue 16 (inside information) first.

\[4 \text{ The other half of the tree, corresponding to “You have no inside information” is not shown.}\]
For those 694 selections Box 2 shows that the positive alternative was displayed 419 times. The mean attractiveness rating for these 419 instances was 83.84, making the house a highly likely B&E target at this stage. By contrast, on 275 occasions participants received the neutral alternative (you have no inside information). The mean rating after this alternative was displayed was 58.45, so clearly having inside information greatly increased the attractiveness of the dwelling.

After Box 2, selections were spread across five different choices. Circle 7 shows that on 136 occasions no more information was requested. On 283 occasions participants made a second choice after learning that valuables were present in the house, and Boxes 3, 4, 5 and 6 show the next cues requested. Boxes 8 to 15 demonstrate the influence of each alternative for each of the four cues chosen. Box 3 shows that on 25 occasions cue 1 (dog) was chosen, and of those 25 instances the deterrent alternative (dog barking loudly) was displayed 12 times (Box 8) and the attractive alternative (no dog) 13 times (Box 9). Box 8 shows that a dog in the house reduced the mean rating from 95.00 to 80.83 while ‘no dog’ produced no change at all in the mean rating.

Figure 4 shows just one of the many decision trees that can be constructed from the data. The value of decision trees is to show the order of subjects’ selections and the

5 This half of the decision tree is not shown.

6 The ‘1-’ in the square brackets in Box 8 denotes the mean for these 12 instances after the positive alternative for cue 16 (inside information) was displayed.
interdependence among cues. The trees illustrate how the effect of a cue is relative to the presence or absence of the deterrent, attractive or neutral alternatives for other cues. Selections vary depending upon prior information received. Subjects often use selections to follow a specific line of enquiry (e.g., how much risk is involved?), seeking to clarify the situation if initial selections reveal conflicting information.

CONCLUSION

The 96 participants in this study demonstrated that they were capable of exercising considerable skill in their trade as burglars. Although it is possible that the computer-based scenario approach (like Cromwell and Olson’s interviews) produces results that exaggerate somewhat the degree of rationality actually used by burglars when on the job, it is nevertheless impressive that they had the domain expertise to generate such detailed and logical decision sequences.

The method has revealed the critical role of five features of a dwelling that could make it extremely attractive as a burglary target: knowing that there are valuable goods inside, that there is an alarm, no dog, no people about in the street, and no sign of anyone being at home (as indicated particularly by no car in the driveway but also by lights, TV or radio being off). These were also the cues most often selected first, but significantly they were by no means equally popular as first selections. The decision tree in Figure 4 illustrates the primary influence of knowledge about valuable goods, which in about a third of instances resulted immediately in a move to the next scenario.
without any attempt to access further information. This strategy was most characteristic of the experienced burglars, who generally arrived at a decision on the basis of less information than the inexperienced participants (Figure 3). Participants in this study were often asked, "Why did you select only one cue?" Their response was generally along the lines: “If I know, from a reliable source, that a house has a large amount of cash inside I don’t care about any of the other information. I will find a way to get in and steal the money.” They also stated that often a large amount of cash would indicate a drug dealer’s house with drugs inside, adding to its attractiveness.

Most decision sequences were of course longer than one step, as Figure 4 shows, although overall participants accessed only one third of the available information. Even when it was known that valuable goods were inside, in most cases participants wanted to know about alarms (especially) but also the affluence of the occupants, the presence of dogs or whether there were people in the street. In the international literature alarms and security seem to have a somewhat uncertain influence on potential burglars, so perhaps their importance to the offenders in this study is a little surprising. It should be remembered, however, that at the time of the study only a minority of dwellings in Australia were equipped with security systems, meaning that there were many other houses that could be burgled without the effort involved in circumventing an alarm.

The mean final attractiveness ratings varied from 17.50 to 86.98 across the 20 scenarios. Moreover, participants arrived at their decision more quickly for the less attractive targets. Putting this another way, low initial ratings seemed to encourage participants to move on, especially if they were more experienced. In terms of prevention this suggests that a home occupant should
seek to deter a potential burglar quickly with a few key cues, otherwise he may increase the range of information he selects and be harder to deter. Noisy little dogs, alarms, and children in the street or teenage children with unpredictable routines spring to mind as possible deterrents. Conversely, if the first piece of information a potential burglar elicits is that a large amount of cash could be kept in the house, he will probably be almost impossible to deter. This is no doubt one reason for the ‘once bitten, twice bitten’ (i.e., repeat victimisation) phenomenon (Farrell & Pease, 1993) – what better way to gain inside knowledge than from a previous visit?

This study might also assist in the development of prevention strategies through a risk assessment instrument for houses. Such an instrument might be able to be made a little more sophisticated than a regression model based on a weighted sum of cues if it took account of how the house appears to a potential burglar and the order in which key pieces of information may be elicited. Caution needs to be exercised when attempting to roll out prevention strategies based on research from other locations; replication studies have produced mixed results (Laycock and Tilley, 1995). However, based on the current study, five features of potential burglary targets (the presence of valuable goods, no alarm, no dog, no people on the street, and no signs of occupancy) are key risk factors. Clearly these five features are a logical starting point for any prevention initiative.

However the primary value of this study might lie not in its implications for prevention – important as these are – but in its potential to support theoretical understanding of offender decision processes. As Nee and Meenaghan (2006, p.935) observe, “there is now ample evidence to suggest a model of target appraisal in the burglar, which is rational and
discriminating in nature and involves the kind of 'bounded' decision making described as expertise in other fields of cognitive science.” The findings of the present study are certainly consistent with this position, and in our view interpretation of decision trees like the one in Figure 4 could be greatly enriched by theoretical insights stimulated by the cognitive science literature, especially models of expert decision-making.

The primary strength of the research methods employed in this study was the tight control over the variables under examination. Because of this, we were able to isolate and examine the effect of specific cues, as well as various combinations of cues. However, it is acknowledged that the research strategy adopted comes with potential costs in terms of external validity. No simulation can capture the subtle and fine distinctions among cues nor the stress and tensions involved in committing a real burglary. It is possible that the remoteness and precision of the computer simulated case studies increased accuracy at the expense of realism. For example, in the study subjects were able to control the order of cues, a situation that typically does not occur in the real world. All research methods have inherent strengths and weaknesses. Notwithstanding these acknowledged qualifications, the current study brings to the field a level of scientific objectivity and rigour that is often absent in much contemporary burglar decision-making research.

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