Behaviourally Effective Communications for Invasive Animals Management: A Practical Guide

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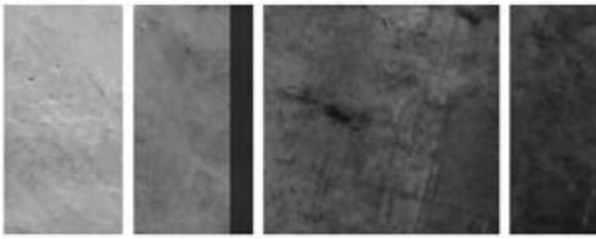

Behaviourally Effective Communications for Invasive Animals Management

A Practical Guide

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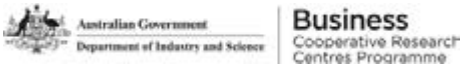
An Invasive Animals CRC Project



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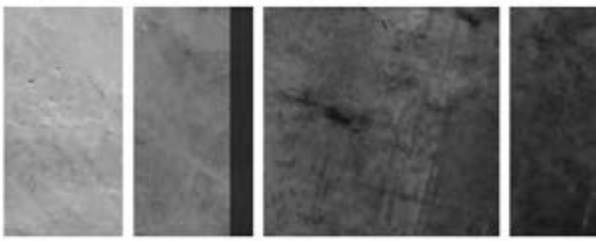

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You wouldn't take a bazooka or pea-shooter to a pig hunt. First, understand your context — then choose your tools carefully.

one

Engaging audiences with behaviourally effective communications

The Invasive Animals Cooperative Research Centre (IA CRC) has developed an impressive set of technologies and recommended best practices for managing and controlling invasive pests. But these proposed solutions will fail unless the public is sufficiently motivated and empowered to change behaviours and adopt new approaches.

Changing behaviour, and sustaining these changes over time, is a difficult process. Educating the public about the negative impacts of invasive animals and providing information about control strategies is rarely enough.

Behaviourally effective communication requires a more sophisticated approach informed by the behavioural sciences. Social psychology and behavioural economics have generated a substantial canon of knowledge about:

- Drivers of, and barriers to, behaviour change
- How to design and deliver cost-effective communication programs that change behaviours for the benefit of society and the environment.

In this guide, we summarise this information, and give practical examples relevant to managing invasive animals. We also recommend how to develop new communications strategies and evaluate current communications against *best-practice* behaviour-change principles.

This guide is for practitioners who are developing and delivering communications related to invasive animals. But many of the general principles and concepts discussed also apply to science communication more broadly. Above all, the guide outlines a systematic approach for developing and evaluating *content-driven communication strategies*, so that policymakers, scientists and engagement specialists can connect more effectively with their target audiences.

A content-driven approach

Modern communicators grapple with constant proliferation. Devices are proliferating, from PCs and laptops to smartphones, e-readers, tablets, wearable tech and beyond. Distribution channels are evolving and growing just as rapidly. Facebook, itself only 10 years young, recently paid $18 billion for WhatsApp, dwarfing, for example, Google's 2006 purchase of YouTube for $1.6 billion.

Much of this change is driven by the phenomenon encapsulated in Moore's Law — the doubling of computing processing power and memory capacity every two years. When so much of our intuition about the future is linear, we are ill equipped to anticipate change unfolding on an exponential scale.

This raises a conundrum for communicators: How can medium- to long-term strategy account for the next device and/or distribution paradigm shift? When change occurs so rapidly — and increasingly rapidly — prediction veers into wild speculation. Furthermore, attempts to strategize based on today's environment are quickly rendered obsolete.

In the face of such flux, the communicator should focus on content. Regardless of future operating environments, the communicator can be confident — at least in the medium term — that devices and distribution channels will exist to serve content. A strategy based on content, rather than the device or platform of the moment, provides core stability through stormy waters of changing circumstance.

Of course, a content-driven model requires the communicator to consider the target audience. And not surprisingly, massive change has also occurred here. A growing proportion of the audience is no longer an audience in the traditional sense. Many of today's users consume, comment, alter and share content. The traditional linear path of content distribution is being supplemented with a far more dynamic process of interactivity.

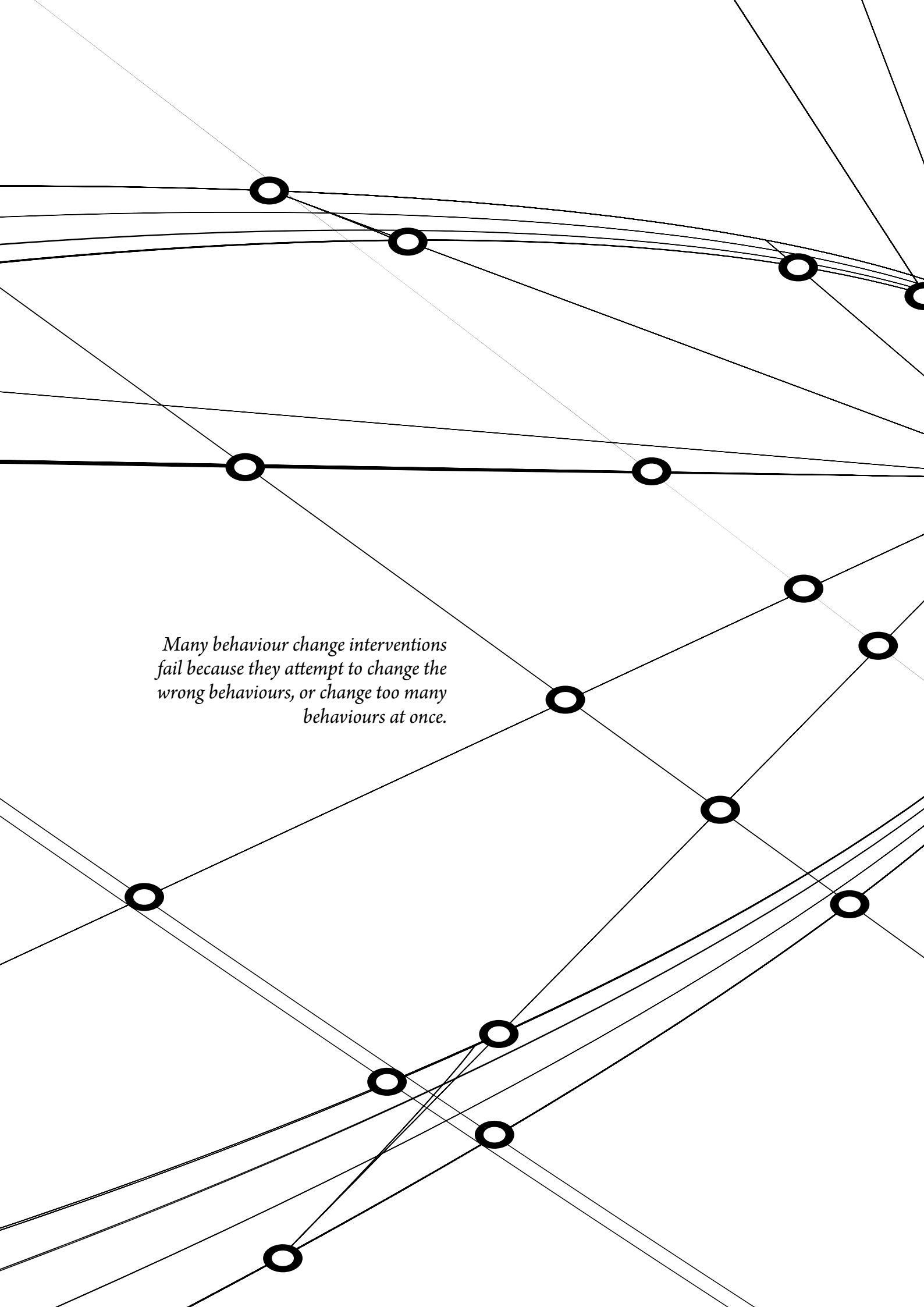
The current and future needs of the invasive animals community are also changing. In this context it is insufficient for content to change attitudes and raise awareness. Along with other behavioural science tools and interventions, content must contribute to changing behaviours.

Understanding the primacy of content, rather than the technological innovations of the moment, is a first, important step. Learning and applying the behavioural principles in this practical guide is the next. Beyond that a process is needed to carry the communicator from goal setting to strategy to execution.

How to use this guide

Each section of this document introduces a key principle for developing effective communications, along with examples of how to apply that principle to invasive animals. Importantly, we have not provided detailed step-by-step instructions about how to apply each principle. This was a conscious decision. Behaviourally effective communications requires much more than following a simple recipe. Each communication context is unique and needs to be systematically evaluated to determine which tools are most likely to be effective. You wouldn't take a bazooka or pea-shooter to a pig hunt. First, understand your context — then choose your tools carefully.

To help bridge the gap between principles and practice, the authors will host workshops for engagement practitioners in 2015 and 2016. We are also developing a set of web-based tools to help invasive animals organisations evaluate and refine their communication strategies.



Many behaviour change interventions fail because they attempt to change the wrong behaviours, or change too many behaviours at once.

two

Linking communication goals to behaviour

> What you get by achieving your goals is not as important as what you become by achieving your goals. · *Henry David Thoreau*

Before designing any communications initiative, it is important to be clear about your primary goal. Is it to increase awareness of the social, environmental and economic impacts of invasive pests? Address knowledge gaps about best practice related to baiting? Shape public attitudes about new control technologies such as ejectors?

Setting clear and specific goals will help shape your program and provide benchmarks to measure effectiveness against.

Communication and behaviour change

The list of potential communication goals is endless. But ultimately most strategies either implicitly or explicitly seek to influence human behaviour. Increasing awareness and knowledge, or changing an attitude, is almost never the desired endpoint. These are way stations on the road toward a more significant and tangible goal: behaviour change.

For example, it is not enough for landholders to know about best practices in baiting; we want them to actually engage in these practices. Likewise, instilling positive attitudes about ejectors is only a first step; we need people to install these ejectors on their properties.

Determining which behaviours to target

Many behaviour change interventions fail because they attempt to:

- change the wrong behaviours, or
- change too many behaviours at once.

McKenzie-Mohr (2011) has developed a simple framework to help prioritise which behaviours to target (see Table 1). Potential behaviours should be rated according to:

- the impact of the behaviour on tangible ecological, economic, social and public health outcomes
- the probability of adoption, and
- the proportion of target population currently engaged in the behaviour (penetration).

In most cases, interventions should aim to influence a small number of high impact behaviours, that have a high probability of being adopted, and currently are not widely practiced within target communities.

You do not want to spend time, energy and money convincing people to engage in activities that will have little impact on your animal management issue. Nor do you want to waste resources trying to influence behaviours that are unlikely to be adopted or that everyone is already performing.

Table 1. A framework for selecting behaviours to target in behaviour change interventions (based on McKenzie-Mohr, 2011).

Behaviour	Impact	Probability of Adoption	Current Penetration	Selection Decision
1	Low	Low	Moderate	✖
2	High	High	High	✖
3	High	High	Low	✔

Note: As a general rule, design communications that target high impact behaviours that have a reasonably high probability of being adopted, and are not already being performed by most of the target audience.

Selecting behaviours related to responsible cat ownership in Tasmania

University of New England doctoral candidate Lynette McLeod recently applied McKenzie-Mohr's (2011) behaviour selection framework to domestic cat management in Tasmania. Lynette's community based social marketing intervention aimed to encourage responsible cat ownership. But she first needed to determine which ownership behaviours to target.

Lynette focused on three important cat management outcomes (improving cat welfare, reducing unregulated breeding, and protecting wildlife from cat predation) and seven ownership behaviours (ranging from micro-chipping to 24-hour containment). To keep things simple, in this example we'll focus on a single cat outcome: reducing cat predation. And we'll focus on three ownership behaviours: de-sexing, night containment and 24-hour containment.

So, which of these three behaviours would be most effective at reducing cat predation?

To quantitatively evaluate the impact, probability and penetration of the ownership behaviours (listed in the table below), Lynette sourced data from existing literature and surveys.

Impact due to predation was defined as the number of prey items saved per week; adoption probability (likelihood that owners would engage in the desired behaviour) and penetration (the proportion of cat owners already doing the behaviour) were determined from recent surveys of cat owners.

Lynette calculated the projected effectiveness of each of the three behaviours by multiplying: impact x adoption probability x (1 – penetration).

The results indicated that *night containment* would be the most effective ownership behaviour to target followed by *24-hour containment*, which has a greater impact on predation than night containment, but is unlikely to be as widely adopted.

De-sexing was identified as the least effective strategy. However, Lynette's analyses revealed that it was an important strategy to reduce other undesirable outcomes such as uncontrolled breeding.

Behaviours	Impact	Probability	Penetration	Effectiveness	Rank
De-sexing*	0	3.5	0.93	0.00	3
Night containment	0.7	3	0.23	0.48	1
24-hr containment	1.1	1.4	0.24	0.37	2

*For this analysis, the direct impact of de-sexing on predation is assumed to be zero because de-sexed cats appear to hunt at the same rate as intact cats (Barrat 1998). De-sexing likely reduces predation indirectly by reducing breeding and the number of cats in the ecosystem. But impacts on breeding were modelled independently in Lynette's analyses.

Barratt, D G (1998). Predation by house cats, *Felis catus* (L.) in Canberra, Australia II Factors affecting the amount of prey caught and estimates of the impact on wildlife. *Wildlife Research, 25,* 475-487.

Key recommendations

1. Communication programs should aim beyond increasing awareness, filling knowledge gaps and changing attitudes.
2. Whenever possible, communication goals should be specified as concrete behavioural outcomes.
3. Target behaviours should be selected on the basis of potential impact, probability of adoption and current levels of penetration within the community.
4. Programs should be clearly evaluated in terms of how much behaviour change they achieve.

Further reading

McKenzie-Mohr, D (2011). *Fostering sustainable behavior: An introduction to community-based social marketing* (3rd ed). *Step 1: Selecting behaviors* (11-20). Gabriola Island: New Society Publishers. http://www.cbsm.com


Messages need to be created and refined with your intended target audience in mind.

three

Knowing your audience: The power of segmentation

> You never really understand a person until you consider things from his point of view... Until you climb into his skin and walk around in it.
> · *Atticus Finch in To Kill a Mockingbird*

Most people talk differently to their mates on a big night out than they do to their children — or at least we hope so! We generally adjust the content and tone of our messages to match our audience. The same principles apply when developing communication strategies for invasive animals. Messages need to be created and refined with your intended target audience in mind.

Understanding mental models

Knowing your audience is important for two main reasons.

First, existing beliefs and knowledge about a topic, sometimes referred to as *mental models*, strongly influence how people seek out, process and integrate new information. For example, people often selectively search for information that is consistent with their beliefs, a phenomenon known as *confirmation bias*. When mental models conflict with current science, invasive animal communicators must introduce strategies to penetrate those models with new information (also see sections 4, 5 and 11 on selecting appropriate messengers, message framing, and debunking misinformation).

Second, mental models often vary across individuals and communities. Not everyone views invasive animal management problems in the same way. Distinct audience segments may reflect different values, beliefs, knowledge and current behaviours. This means that you, as a communicator, may not be dealing with a single target audience – you may be dealing with several. The number and nature of these audiences must be understood before designing and implementing a communication strategy.

Segmenting based on perceived benefits and barriers

If your primary goal as a communicator is to change behaviours, it is important to identify why people do or don't engage in those behaviours. A good place to start is with the main social psychological and behavioural economic models of behaviour and behaviour change.

This may seem like a daunting task, but luckily much of the hard work has already been done. For example, Darnton (2008) has generated an excellent summary of over 60 such models, highlighting important benefits of and barriers to behaviour change (e.g., values, beliefs, attitudes, knowledge gaps, situational constraints, etc.). He also has developed a practical guide outlining how these factors can be integrated into behaviour change interventions.

Beyond this starting point, it is important to account for your local situation. For example, drivers and barriers relevant to rabbit control in peri-urban areas will be different to those for domestic cat management in urban settings. Thus, message developers cannot rely on theory alone to identify drivers and barriers. Key informant interviews, focus groups or community surveys can help identify the most promising buttons to push.

After perceived benefits and barriers are identified, they should be integrated with the audience segmentation analysis. This will clarify whether the same or different influence factors are operating across audience segments, and can be used to tailor communications to effectively engage each segment.

Segmenting based on stages of change

Behaviour change is often gradual and follows a process. People who are adamantly opposed to baiting wild dogs one day generally don't turn into avid baiters the next.

Perhaps the most influential model of behavioural change is the *Transtheoretical Model* (Prochaska & DiClemente, 1992). According to this model, when people change, they progress through five distinct stages:

1. **Pre-contemplation**: Where they are not considering change.
2. **Contemplation**: Where they are beginning to think about change.
3. **Preparation:** Where they make a personal or public commitment to change in the near future.
4. **Action:** Where they are actually changing their behaviour.
5. **Maintenance:** Where they are maintaining the changed behavior.

And, of course, the possibility of relapse also exists, where individuals fail to maintain the new behaviour and move back to an earlier stage in the change process. If you have ever tried to quit smoking or go on a diet, you know the drill.

When developing a communications strategy, it is useful to consider where your audience currently sits in the change process. Different stages require different goals and therefore different strategies. Possible goals linked to each stage of change are presented in the table below.

Table 2: Stages of change and communications goals

Stage of change	Communication goals
Precontemplation	Increase awareness about problems with invasive animals. Engage emotions to capture attention.
Contemplation	Increase motivation to change. Highlight costs of maintaining current practices and the benefits of IA CRC recommended practices.
Preparation	Increase self-efficacy and confidence. Reinforce beliefs that change is possible and desirable. Help users plan for change by enhancing knowledge and skills related to recommended practices.
Action	Provide real-time support and advice. Highlight common pitfalls and barriers to best practice, and how to avoid them.
Maintenance	Provide feedback on progress and constructive advice for continuous improvement. Provide reminders and prompts to help ensure desired practices continue.

Audience segmentation: Quantitative and qualitative approaches

Audience segmentation analysis commonly improves communications about health, political and pro-environmental behaviour. It identifies clusters of stakeholders (segments) who share similar values, beliefs, knowledge, behaviours and demographics.

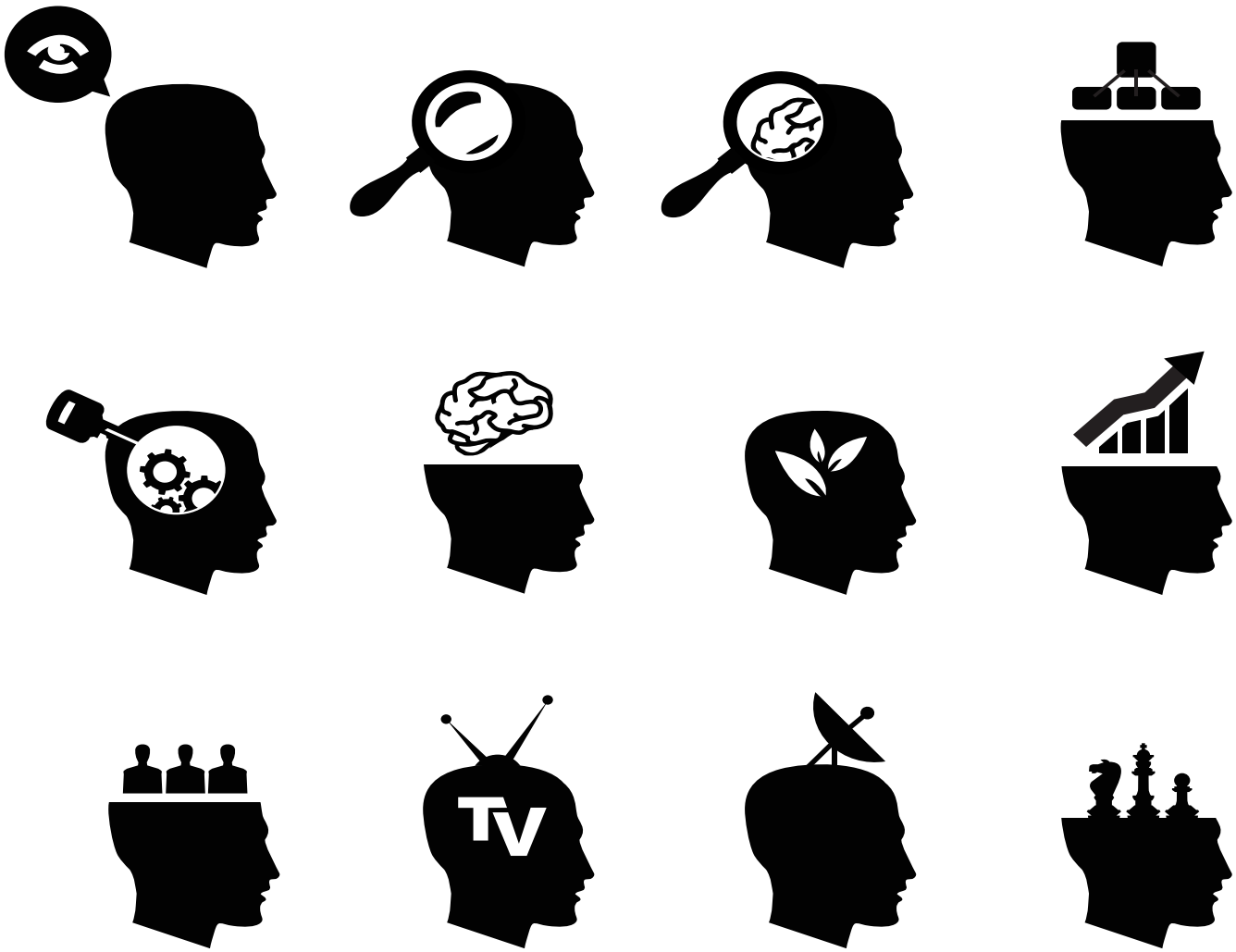
It is often used to tailor and target messages to specific subgroups.

Statisticians typically identify audience segments by applying procedures like cluster and latent profile analysis to quantitative survey data. These techniques are complex, so it is usually a good idea to approach a statistician from your organisation or local university.

Depending on your goals, qualitative approaches, based on key-informant interviews, focus groups and literature reviews, can be cheaper than quantitative segmentation.

Importantly, there is no single correct way to segment. The ideal approach depends on goals, available expertise, financial resources and time constraints. Nevertheless, the benefits of segmentation will generally outweigh the costs, and many strategies exist to segment on a shoestring budget (Slater et al., 2006).

Slater, M (2006). Segmentation on a shoestring: Health audience segmentation in limited- budget and local social marketing interventions. *Health Promotion Practice*, 7, 170-173.



Key recommendations

1. Before designing your communication strategy (or when reviewing an existing one), gather information about the values, beliefs, knowledge and behaviours of your target audience. You can also segment based on perceived benefits and barriers of key behaviours.
2. Use audience segmentation analysis to identify the number of distinct audiences in your population.
3. Make sure your audience segments reflect the target population by using representative sampling procedures, such as random sampling, when collecting data.
4. To maximise impact, tailor and target messages to specific audience segments, or construct non-tailored messages that appeal to commonalities across segments.

Further reading

Darnton, A (2008), *GSR Behaviour Change Knowledge Review. Practical Guide: An overview of behaviour change models and their uses.* London: HMT Publishing Unit. http://www.civilservice.gov.uk/wp-content/uploads/2011/09/Behaviour-change_practical_guide_tcm6-9696.pdf

Hine DW, Reser, J, Morrison, M, Phillips, WJ, Nunn, P, & Cooksey, R (2014). Audience segmentation and climate change communication: Conceptual and methodological considerations. *Wiley Interdisciplinary Reviews – Climate Change.* DOI: 10.1002/wcc.279.

McKenzie-Mohr, D (2011). *Fostering sustainable behavior: An introduction to community-based social marketing* (3rd ed). Step 2: *Identifying barriers and benefits* (21-39). Gabriola Island: New Society Publishers.

Prochaska, JO; DiClemente, CC; Norcross, JC. (1992). In search of how people change. Applications to addictive behaviors. *American Psychologist*, 47, 1102–14.

For better or worse, many people will no longer change their beliefs or behaviour in response to expert advice or scientific consensus.

four

Messengers matter: How to select the right one

Trust is the glue of life. It's the most essential ingredient in effective communication. It's the foundational principle that holds all relationships.

· *Stephen R. Covey*

We live in an era of growing public scepticism. For better or worse, many people will no longer change their beliefs or behaviour in response to expert advice or scientific consensus. In the absence of trust, key invasive animal messages will be dismissed or ignored. Selecting the right messenger is one important way to build and maintain trust.

Choosing your messenger

When selecting a messenger, several key principles apply.

- **First impressions matter.** Before processing messages, people often form emotional impressions about the 'likability' of the messenger. Arrogant, cocky or indifferent messengers can turn off audiences, increasing the chances of their advice being ignored or discarded.
- **Perceived expertise is important.** In general, people respond favourably to messengers with extensive relevant experience and competence. Messengers who know their stuff, and can convey information in a confident, non-technical manner are more likely to receive a positive response.
- While expertise is important, **demographic and behavioural similarities also matter.** Select messengers who share key characteristics with your target audience. For example, when addressing rural audiences, using 'trusted local champions' can combine the benefits of expertise and similarity. Whenever possible, avoid messengers who might be perceived as outsiders.
- **Choose messengers who are genuinely concerned about managing invasive animals.** When engaging landholders about pig or fox issues, messengers who care about the issue and appear genuinely committed to solving the problem are more likely to succeed. If an audience believes the messenger is indifferent or disengaged, the message will be discounted.
- **Honesty and openness are valued attributes**. Messengers should acknowledge complexity and uncertainty and avoid over-promising. Extreme claims that a technology is 'fool proof' or has 'no-risk' will lack credibility. Consistent messaging over time, as opposed to telling people what you think they want to hear, can also help build and maintain trust.
- **Different messengers may be required for different audience segments.** As noted earlier, values, beliefs and attitudes about managing invasive animals can vary considerably. Make sure you understand your distinct audiences and select messengers who can engage effectively with each segment.

Key recommendations

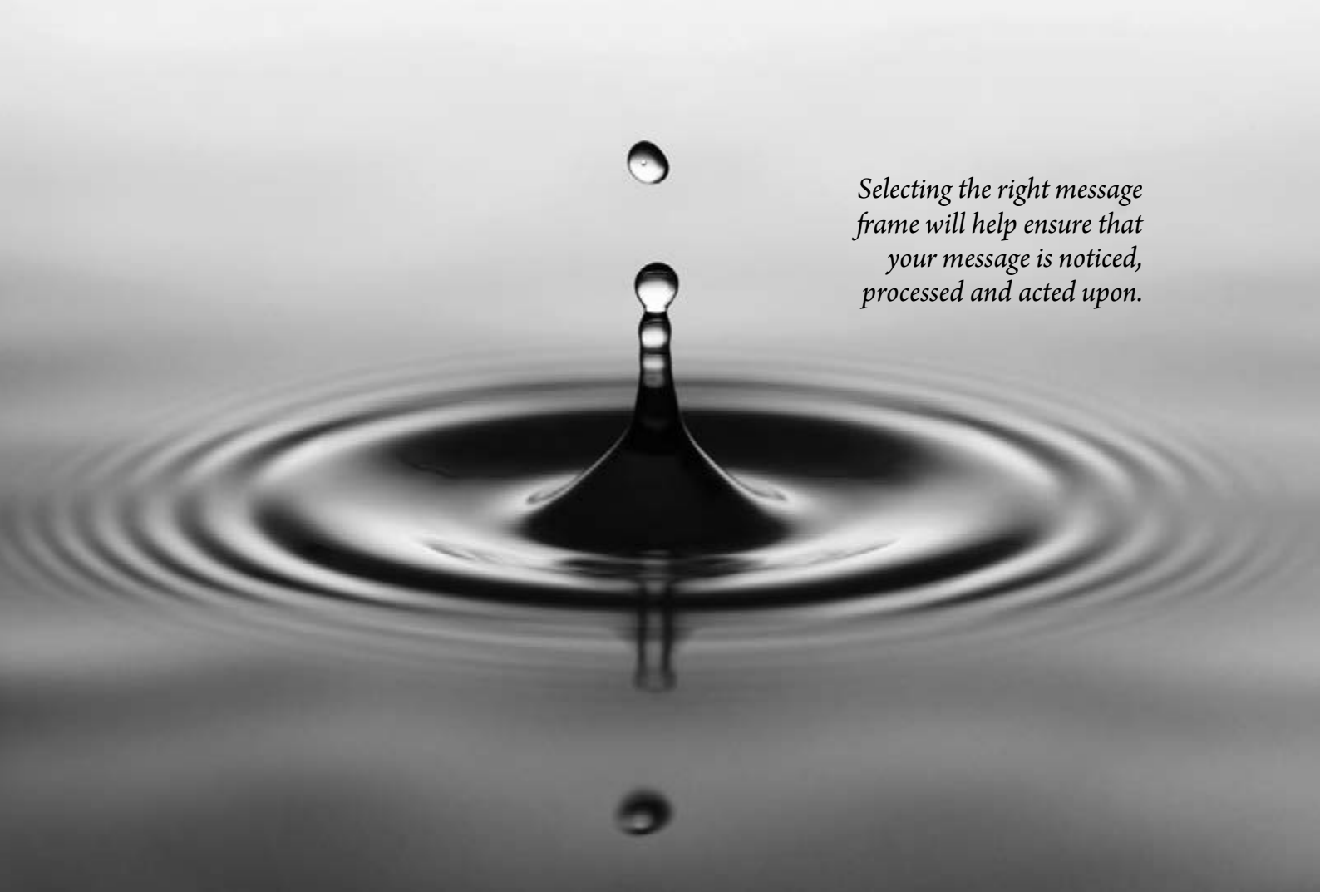
1. Who delivers the message matters. The right message may fail with the wrong messenger.
2. Messengers are more likely to succeed if they are likable, honest, emotionally engaged, have relevant expertise and are similar to the target audience.
3. Recognise that different audiences may require different messengers.

Further reading

Cialdini, RB (2014). *Influence: Science and practice* (5th ed). *Liking: The friendly thief* (155-192). *Essex UK: Pearson.*

Cialdini, RB (2014). *Influence: Science and practice* (5th ed). Authority: Directed deference (193-220). *Essex UK: Pearson.*

Renn, O & Levine, D (1991). Credibility and trust in risk communication. In Kasperson and Stallen (Eds). *Communicating risks to the public*. Dordrecht, Netherlands: Kluwer Academic Publishers.



Selecting the right message frame will help ensure that your message is noticed, processed and acted upon.

five

Framing messages for maximum impact

> Speak clearly, if you speak at all; carve every word before you let it fall. · *Oliver Wendell Holmes*

Most people operate in information-rich environments, with many messages competing for their attention. Selecting the right message frame will help your message be noticed, processed and acted upon.

Message framing involves presenting an issue in a way that achieves a desired interpretation. To maximise impact, it is important to choose a frame that matches the audience's values and concerns. Thus, it is important to 'know your audience' before selecting your message frame (see section 3 of this guide).

Many message frames exist. We highlight several below that are particularly relevant to invasive animal issues.

Consequence frames

An effective way to gain audience attention is to highlight the consequences of not taking action to address a problem. For example, when communicating about wild dogs to property managers, it may help to frame messages of financial loss. Families in rural and peri-urban areas may be receptive to framing around potential health and mental health impacts. Politicians and policy makers may be sensitive to national security and economic frames. In all instances, the core messages can remain the same: "A wild dog control strategy is required and the IA CRC recommends the following approaches". But the frames change for each audience.

Behavioural science research into consequence frames is still in its infancy. We don't yet have conclusive evidence about which frames work best with which audiences. You can help build this evidence by carefully evaluating your communication programs — the successes and failures — and sharing this information with other organisations that manage invasive animals. This will help us systematically build knowledge over time, about what works and with who (refer to section 13).

Locally relevant frames

Generally, people see local problems as more relevant and urgent than problems on the other side of the country or world. By framing the damage of invasive animals as a local issue, you can increase the audience's sense of connection to the issue, and also develop local and regional initiatives that can grow into more broad scale national and global initiatives.

Now versus future frames

It is difficult to motivate people to act on problems that will occur years, decades or centuries in the future. Although long-term impacts should be accounted for, communicators should realise that people often discount the importance of future events, a psychological phenomenon known as 'temporal discounting'. Presenting a problem as 'happening now', and highlighting short-term consequences of inaction (e.g., stock losses, reduced yields, etc.), can get your audience's attention and trigger action.

Fear appeals

Considering the threats posed by invasive animals, there appears to be much to fear. But can appeals to fear cause behaviour change? Although some communicators prefer to avoid frightening their audiences, considerable evidence exists that fear is an important driver of human behaviour.

For example, you may remember the widespread concern, at the turn of the century, about the perceived threat of large tracts of land succumbing to salinity. This prompted many landholders to plant trees in groundwater recharge zones to reduce the hazard.

In terms of communications, a meta-analysis by Witte and Allen (2000) concluded that strong fear appeals lead to the greatest behavioural change when coupled with concrete advice about how to avoid, eliminate, or reduce the threat. That is, 'scaring the pants off people' only seems to work if you also boost 'response efficacy' — knowledge and skills to effectively manage the threat.

Wild dogs and the human health frame

Making connections between wild dogs and human health may elevate public concern about this issue — particularly in peri-urban areas where contact between wild dogs and people is more common.

Although most people understand the risks associated with wild dog bites, many don't know that wild dogs carry several parasites — such as round worms, hook worms and hydatid — that are dangerous and sometimes fatal.

By highlighting the serious public health consequences, communicators can frame the wild dog issue as a concrete, personal concern for everyone who lives where wild dogs are present.

Highlighting human health impacts may elicit fear in your audience. Research suggests that fear can be an important motivational driver of behaviour change. However, as noted earlier, fear only works if accompanied by concrete advice about how to deal with the threat.

By itself, or when coupled with weak efficacy messages, fear tends to create defensive responses, such as denial and disengagement — two outcomes that most communicators would like to avoid.

Key recommendations

1. Select message frames that match your audience. You may need different frames for different audiences.
2. To maximise impact, use frames that emphasise local and immediate consequences.
3. Use fear appeals with caution, and only coupled with information to boost response efficacy.

Further reading

Center for Research on Environmental Decisions (2009). T*he psychology of climate change communication.* Columbia University. http://cred.columbia.edu/publications-resources/cred-communications-guide/

Kahneman, D & Tversky, A (1984). Choices, values, and frames. *American Psychologist*, 39, 341-350.

O'Keefe, DJ & Jensen, JD (2009). The relative persuasiveness of gain-framed and loss-framed messages for encouraging disease detection behaviors: A meta-analytic review. *Journal of Communication*, 59, 296-316.

Witte, K. & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education and Behavior*, 27, 591-615.

Emphasising themes like community, helping, and cooperation will encourage your audience to become more benevolent, and, at the same time suppress selfish tendencies linked to extrinsic values.

six

Activating values with deep frames

> The aim of education is the knowledge, not of facts, but of values. · *William S. Burroughs*

Values are things we consider significant in our lives; they play a central role in shaping our ethics, aspirations, attitudes and behaviour. Social psychologists, working over decades and across many cultures, have identified over 50 universal values that we all hold, including those related to health, wisdom, freedom, success and national security.

Although universal values are assumed to be present in all of us, we may prioritise them quite differently. For some, freedom may take precedence over national security, and for others the reverse.

Recent psychometric work has distilled universal values into 10 discrete groups, shown as a circumplex in Figure 1 (Schwartz & Boehnke, 2004, cited in Blackmore et al., 2013). Within the circumplex, two competing types of values are relevant to social and environmental issues. These two sets of values are known as 'intrinsic values' and 'extrinsic values'.

- **Intrinsic values** focus on activities and outcomes related to self-direction, benevolence and universalism. If these values are prioritised, people are more likely to work with others in our community and care for the environment. Collectively, these values are sometimes referred to as our 'civic' side.
- **Extrinsic values** focus on activities and outcomes related to power and achievement. If these values are prioritised, people are more likely to be driven by concerns about self-interest, external status and financial benefits. These values reflect our 'consumer' side, and are commonly associated with materialism and unsustainable lifestyles.

An important quality of the values circumplex is that values located at opposite sides of the circumplex are incompatible and conflict. That is, individuals who prioritise intrinsic values will de-prioritise extrinsic values.

Equally important — the structure of our value preferences is somewhat fluid; our priorities change depending on context. Certain contexts, such as a community meeting to plan a response to an ecological threat such as carp or free-roaming cats, may lead us to prioritise intrinsic values that support a unified cooperative response. On the other hand, attending a workshop on maximising farm income may prime extrinsic values linked to wealth acquisition and power.

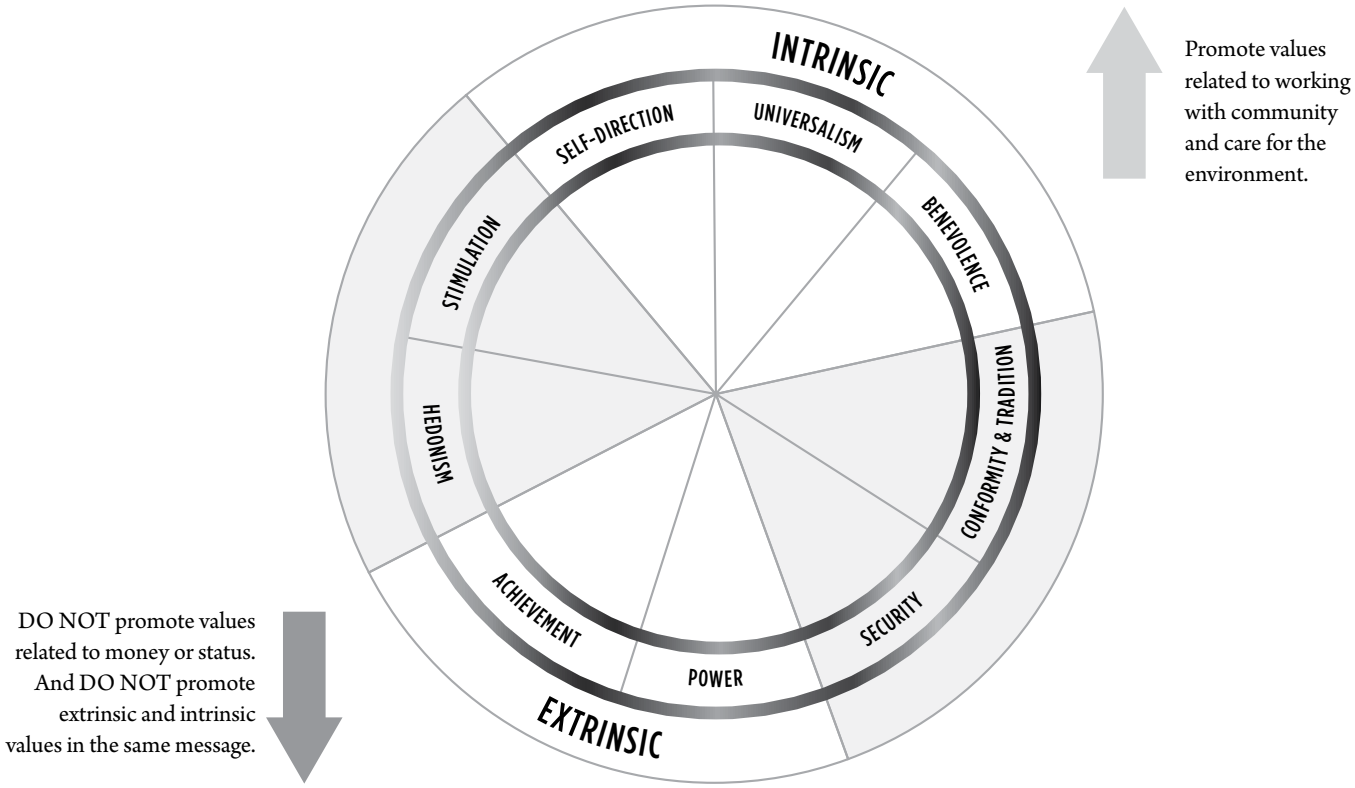


Figure 1: Schwartz's Values circumplex. Adapted from Blackmore et al. (2013, p 21).

Getting people to work together through deep framing

Deep framing is developing messages that operate at the level of values, priming values we want to promote. When using deep framing to change behaviour, it is important to align behaviours with desirable values.

By drawing people's attention to intrinsic values such as benevolence and universalism, communicators can encourage the audience to act in a way that benefits the community and environment. For example, one study found that participants were significantly more likely to volunteer after reading words related to equality and fairness (priming intrinsic values) than after reading words related to power and ambition (priming extrinsic values).

If you aim to get audience members working together to solve a common environmental problem, develop 'deep-framed' communications that prime intrinsic values.

Deep-framed communications can also strengthen desirable values over time, and simultaneously weaken undesirable values. By repeatedly priming intrinsic values, these values will become more important to your audience. Emphasising themes like community, helping and cooperation will encourage your audience to become more benevolent and, at the same time, suppress selfish tendencies linked to extrinsic values.

Priming intrinsic values can also promote spillover effects to new domains. One common criticism of traditional social marketing interventions is that they elicit shallow change. That is, typical interventions target behaviours such as baiting or ripping rabbit warrens, while ignoring deeper worldviews and values that can drive these behaviours more broadly. Strengthening intrinsic values may create behavioural changes across a broad range of invasive animal management programs, and beyond.

Figure 2 illustrates the relationship between other well-known psychological constructs (on the left hand side) and a conceptual model of frames (on the right hand side).

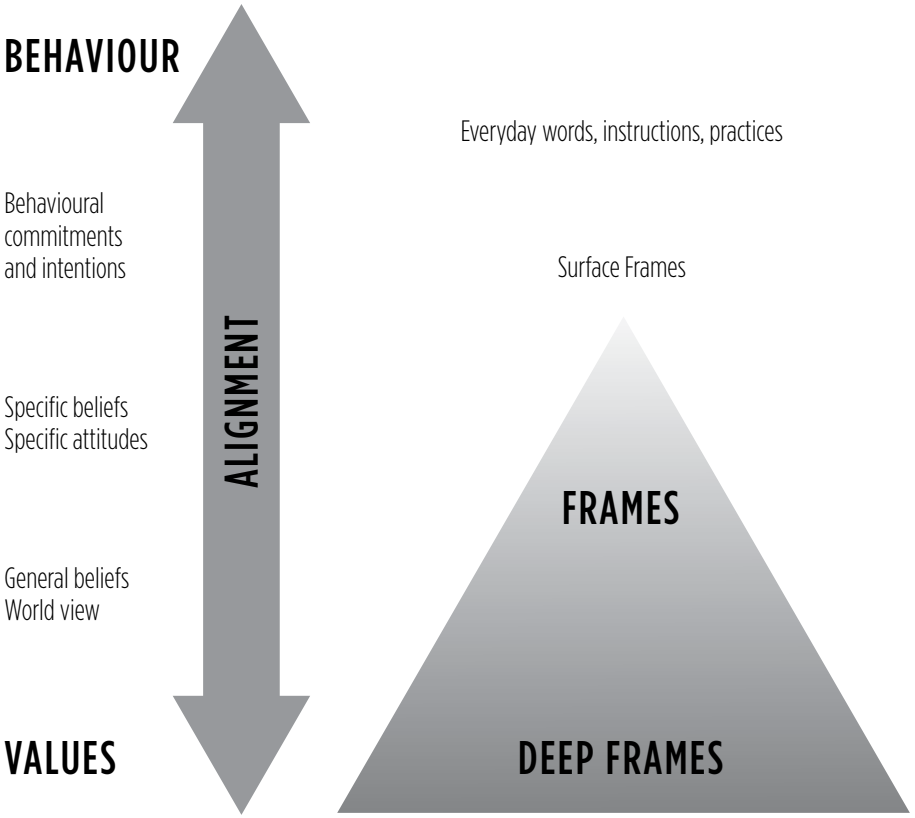


Figure 2: Relationship between a conceptual model of frames and the values-beliefs-attitudes-behaviour hierarchy. Adapted from Darnton and Kirk (2011, p 78).

The 'animal welfare' deep frame

Over the past decade, pest animal stakeholders have worked with groups like the RSPCA to incorporate animal welfare concerns into pest control. The humane treatment of animals represents a deep frame that is increasingly common in pest control communications.

The Invasive Animals CRC has a full section on Animal Welfare in their PestSmart Toolkit website. The following extract illustrates the 'humane treatment' deep frame:

Historically, pest animal control has focussed on killing as many pests as cheaply as possible. For most people in today's society the management of pest animals is acceptable provided that such management is humane and justified. However, many of the methods used to control pest animals in Australia are far from being humane. There is a pressing need to improve the humaneness of control programs and to develop a process that enables the most humane methods to be identified.

Using deep frames emphasising the humane treatment of animals has led to the development of numerous guides and codes of practice consistent with this frame (e.g., Sharp and Saunders, 2011).

Sharp, T & Saunders, G (2011). *A model for assessing the relative humaneness of pest animal control methods (Second ed.)*. Canberra, ACT: Australian Government Department of Agriculture, Fisheries and Forestry.

Key recommendations

1. Develop communications that strengthen intrinsic values related to care and cooperation with the local community (benevolence) and concern for the environment (universalism).
2. Avoid communications that strengthen extrinsic values related to wealth, personal status and self-interest. Strengthening these values will weaken the intrinsic values required for a coordinated social response to invasive animal problems.
3. Never attempt to directly negate a frame linked to extrinsic values (e.g., stating that money and power are undesirable). Simply mentioning these values will activate them. Focus on those values you wish promote; ignore the others.

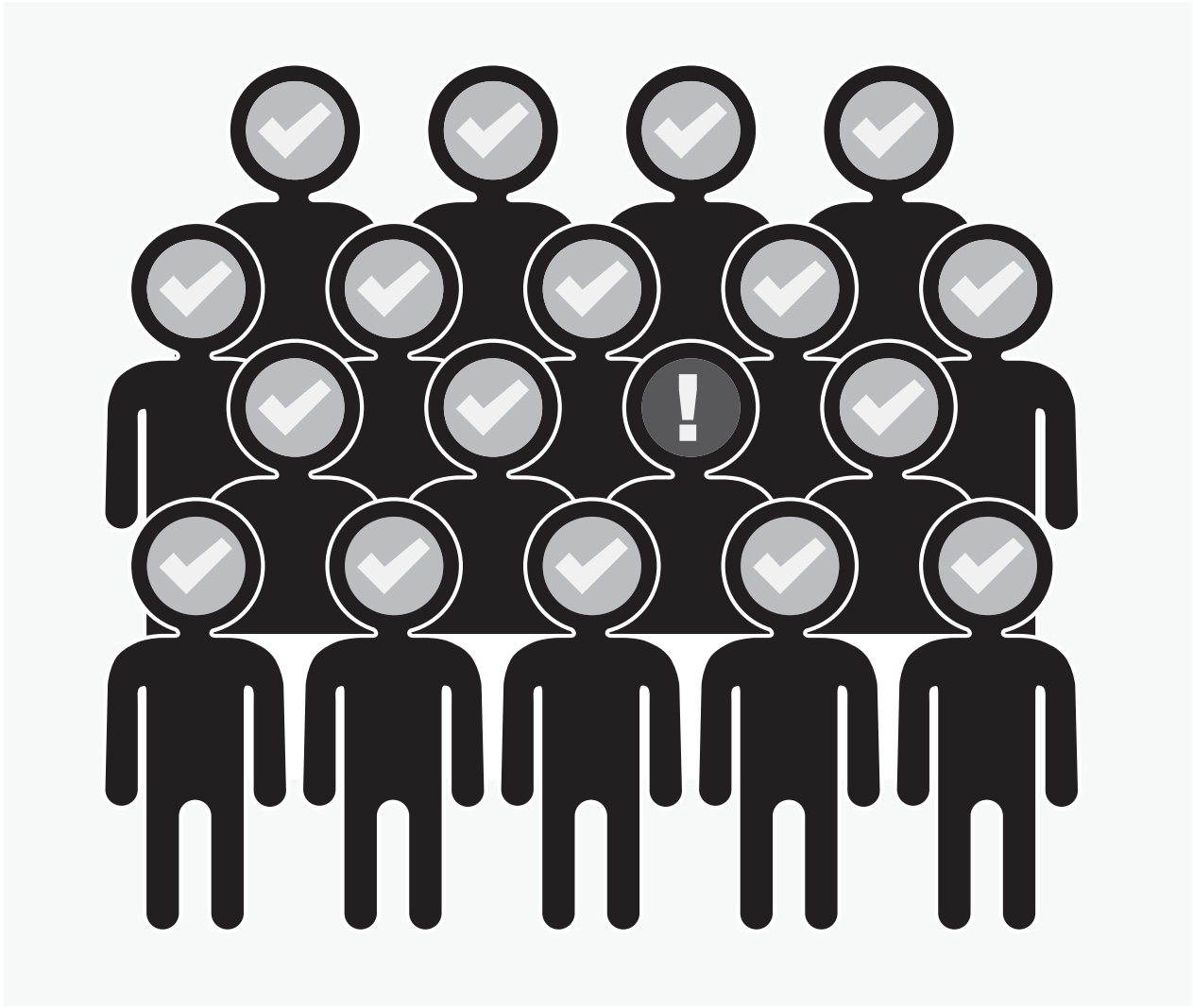
Further reading

Blackmore, E, Underhill, R, McQuilkin, J & Leach, R (2013). *Common cause for nature: Finding values and frames in the conservation sector.* Machynlleth, Wales: PIRC.

Darnton, A & Kirk, M (2011). *Finding Frames: New Ways to Engage the UK Public in Global Poverty*, Bond, London.

Lakoff, G (2010). Why it matters how we frame the environment. *Environmental Communication: A Journal of Nature and Culture*, 4/1, 70-81.

Sharp, T & Saunders, G (2011). *A model for assessing the relative humaneness of pest animal control methods (Second ed.)*. Canberra, ACT: Australian Government Department of Agriculture, Fisheries and Forestry.



seven

Moving the herd using social norms

People, like sheep, tend to follow a leader — occasionally in the right direction. · *Alexander Chase*

Social norms influence behaviour based on how others behave. They help people determine what is normal, expected or correct. For example, if most of your neighbours engage in local 'carp busting' events, this norm increases the probability that you will also participate. To be effective, norms must be public and highly visible. If you don't know what your neighbours are doing, obviously their actions can't influence you.

Descriptive norms: The power of social comparison

Descriptive norms describe how others behave. Including descriptive norms in messages is important because most people are predisposed to follow the crowd. If you want more property managers to bait at specific times of the year, suggest that most managers in the area are baiting at these times. If you want farmers to destroy rabbit warrens on their properties, let them know that others are already doing so.

However, descriptive social norms are only effective if most people are already engaging in the desired behaviour. If most people are not baiting or destroying warrens, using descriptive norms may actually promote these undesirable behaviours and suppress the desired behaviours. Seeing that most others are not acting will create normative pressure towards inaction.

In a classic study on home energy use, Schultz et al. (2007) found that households who received information about their own energy use relative to the neighbourhood norm decreased their consumption if they were above the norm, but increased their consumption if they were below the norm! Thus, the impact of descriptive norms can be good or bad, depending on how current behaviour relates to the norm.

Injunctive norms: The power of perceived approval and disapproval

Injunctive norms tell us the likely social approval or non-approval for particular behaviours. Whereas descriptive norms describe what others are doing, injunctive norms describe what others *should* be doing, by emphasizing what a group, or society as a whole, values.

For example, if a property owner sees many of her neighbours laying baits for feral pigs — that would be a descriptive norm. If she sees her neighbours being praised for baiting in a local newsletter, that would be an injunctive norm — the communication clearly conveys that others value the behaviour.

Unconscious effects

Although social pressure influences behaviour, people are often unaware of or underestimate these effects. People tend to believe that their decisions and behaviours are self-determined, guided by a rational consideration of costs and benefits.

However, considerable evidence exists that many decisions and behaviours occur automatically with little, if any, conscious control. Social norm effects often fall into this category.

If you ask landholders why they bait, they will generally mention financial benefits, minimising stock losses, and so on. Rarely do people indicate that they are conforming to a descriptive norm ("I bait because most of my neighbours bait") or injunctive norm ("I bait because I expect to gain social approval for doing so").

Nevertheless, the experimental evidence from psychology is clear; the social pressure embedded in descriptive and injunctive norms can change behaviour. It's in our DNA to crave social approval and follow the crowd.

Establishing new social norms in rabbit management

The Granite Creeks Project group in Victoria has used several methods to gently apply peer pressure and establish new social norms to improve rabbit management.

A degree of peer pressure has been used to drive the message, "rabbit management is a community issue and it needs to be dealt with at a community level".

Associated with this message is a new norm that government officers work *with* community and, *vice versa,* community actively engage with government officers. 'Relationship' is now a central factor for obtaining effective rabbit management.

A new norm has also developed in the community that people deserve to be fined if they don't engage with their community in rabbit management. This pressures those who don't comply to lift their game or suffer the consequences of production and biodiversity loss, and potential litigation.

Information provided by Neil Devanny, Chair, Granite Creeks Project Inc.

It's in our DNA to crave social approval and follow the crowd.

Key recommendations

1. Embed social norms into communications by highlighting that most people are already engaging in the desired behaviour (descriptive norms) or that the desired behaviour is valued and is the "right thing to do" (injunctive norms).
2. If you include both descriptive norms and injunctive norms in your communications make sure they are aligned — nudging behaviour in the same direction.
3. Avoid using descriptive norms when dealing with well-established negative behaviours. Telling people that the undesirable behaviour is normal can significantly impede behaviour change.

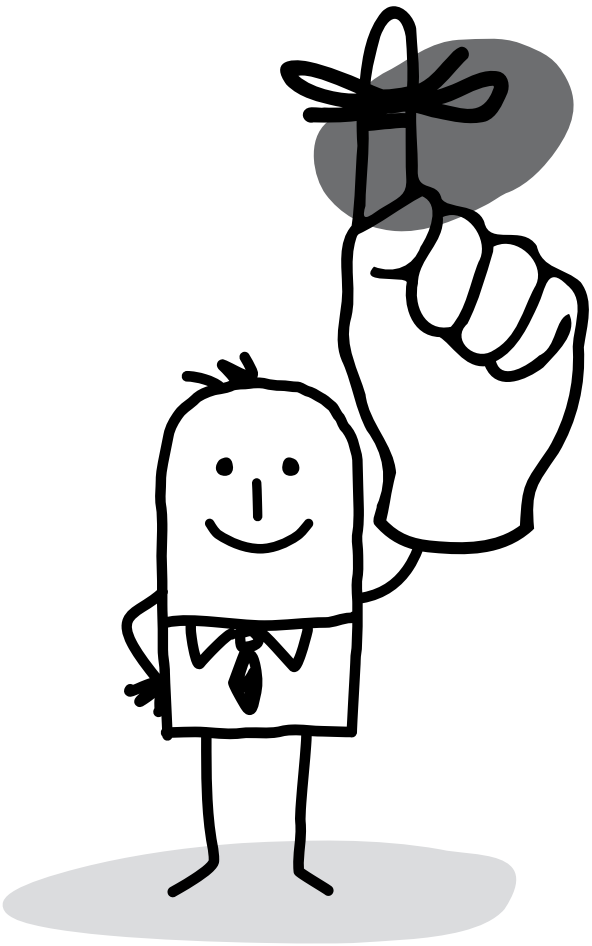
Further reading

Cialdini, R.B (2013). *In Influence: Science and practice* (5th ed). *Essex UK: Pearson. Social proof: Truths are us* (107-154).

Earls, M (2009). *Herd: How to change mass behaviour by harnessing our true nature.* Chichester West Sussex UK: Wiley.

Schultz, PW, Nolan, JM, Cialdini, RB, Goldstein, NJ & Griskevicius, V (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science,* 18, 429-434.

eight



Using prompts and commitments to move from good intentions to action

> One lives with so many bad deeds on one's conscience and some good intentions in one's heart. · *John Dewey*

People often have the best intentions to 'do the right thing', but fail miserably when it comes to action. Prompts and commitments are two strategies that can increase the probability that people will act on their good intentions.

Prompts

Many people fail to act on good intentions for a simple reason — they forget. Life is complicated. Running a property, raising a family, and even negotiating the daily commute all tax memory and, more often than not, some things fall through the cracks. Prompts combat this through visual and auditory aids to remind us of what we want to do.

Importantly, the primary purpose of prompts is *not* to educate, motivate or persuade. Prompts are reminders for people who already want to undertake the behaviour. For example, in baiting programs, local coordinators could send email, SMS or push notifications through a dedicated smartphone app to ensure landholder activities are coordinated for maximum benefit. For domestic cat control, window stickers or fridge magnets could remind residents to keep their felines 'locked up' each evening.

For maximum impact, prompts should be:

- Explicit and precise. The prompt "Remember to bait today" is good, but "Remember to bait this morning with 1080 in paddock 6" is better. For unfamiliar or complex behaviours, create prompts that describe each step. Alternatively, include a short video showing an expert modelling these actions.
- Presented close in time and space to the target behaviour. For example, reminders about cat containment should be placed in highly visible locations that people will likely encounter just before going to bed. For individuals wedded to their smartphones, pre-set reminders and push notifications can influence behaviours at the right time.

Commitments

We often judge others based on how consistent they are, in words and deeds. And, not surprisingly, most people don't like being labelled "unreliable", "inconsistent" or "hypocritical".

As a result, getting verbal or written commitments has a powerful effect on behaviour. Once people *commit* to baiting, containing their cats, or upgrading their fencing, they are much more likely to follow through and act.

Mckenzie-Mohr (2011) highlights several key principles when obtaining commitments:

- Commitments should be voluntary. Focus on behaviours that people have expressed an interest in performing. Commitments coerced from reluctant targets will fail.
- Get it in writing. Written commitments are more effortful and durable than verbal commitments, two factors associated with greater behaviour change.
- Make it public. Ask permission to post commitments on public notice boards or websites. The more public a commitment, the more likely people are to honour it. For behaviours that must be sustained over time, make sure that commitments remain highly visible.
- Use 'call backs'. After people commit, ask them when they think they will engage in the new behaviour, and whether you could phone or drop by to help with any problems. The act of agreeing to the call back increases pressure to stick to the initial commitment.
- Look for efficiencies. Soliciting commitments can be resource intensive and time consuming. Where possible, enlist stakeholders to visit and call target properties, households and businesses. When 'outsourcing' commitment work, follow the recommendations in the "select the right messenger" section (see section 4).

People often have the best intentions but fail miserably when it comes to action.

Key recommendations

1. Use prompts for people who already want to undertake the behaviour. Prompts are memory aids, not persuaders.
2. Whenever possible, get commitments that are voluntary, written and publicly displayed. Use call backs to further strengthen commitment effects.
3. Use prompts and commitments together. First get the commitment, and then use prompts to help people stay on course.
4. Check out the *Tools of Change* social marketing website for extensive examples of prompts and commitments. www.toolsofchange.com/en/tools-of-change/prompts/ www.toolsofchange.com/en/tools-of-change/obtaining-a-commitment/

Further reading

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McKenzie-Mohr, D (2011). *Fostering sustainable behaviour: An introduction to community based social marketing* (3rd edition). *Commitment: From good intentions to action* (45-59). Gabriola Island, BC, Canada: New Society Publishers.

Lokhorst, AM, Werner, C, Staats, H van Dijk, E & Gale, JL (2013). Commitment and behavior change: A meta-analysis and critical review of commitment-making strategies in environmental research. *Environment and Behavior,* 45/1, 3-34.

nine

Dual process models: Two roads to persuasion

> I'm going to take the high road because the low road is so crowded. · *Mia Farrow*

Several psychologists, including Nobel Laureate Daniel Kahneman (2011), have persuasively argued that human decision making and behaviour are guided by two distinct thinking systems.

> **System1**, the experiential system, is fast, effortless, automatic, subconscious, and is closely linked to intuition and emotion. This system reflects your 'instinctual and spontaneous self'.
>
> **System 2**, the analytic system, is slow, effortful, logic-based and largely free of emotion. You can think of this system as your 'inner academic'

Both systems operate in all people, but importantly:

- People tend to have a preference for one system over the other. Some of us — *System 1 types* — like to make decisions based on our gut feelings. Others — *System 2 types* — prefer to carefully think things through.
- Situational factors can nudge people towards System 1 or System 2 thinking. For example, most people rely on System 1 for routine decisions, but invoke System 2 in novel situations when the consequences of making a mistake are perceived to be high. Choosing a brand of toothpaste is typically handled automatically by System 1. On the other hand, when landholders consider a major financial investment into invasive animal control, most would engage System 2.
- The two thinking systems are not completely separate. System 2 can override automatic responses triggered by System 1. And rational evaluation of costs and benefits, the domain of System 2, can be biased by emotional outputs from System 1. For example, people who love dogs would likely perceive fewer benefits and more costs associated with 1080 baiting. The bottom line is that so-called 'dispassionate rational analysis' rarely exists. It is almost always biased by our automatic emotional responses.

We strongly recommend taking the 'high road' to persuasion.

Figure 3: Thinking fast and thinking slow. Source: Diagram by Created by Eva-Lotta Lamm (2012). *Eva-Lotta Lamm's Sketchnotes 2012.* www.sketchnotes.com. Downloaded from: https://www.flickr.com/photos/evalottchen/6352121909/in/photostream/

Elaboration likelihood: The high and low roads to persuasion

Understanding how Systems 1 and 2 work is critically important when crafting persuasive messages. Petty and Cacioppo's (1981) *Elaboration Likelihood Model* identifies two roads to persuasion, which depend on how much people 'think about' (elaborate on) the persuasive message.

- **Central route processing**, the high road to persuasion, occurs when people invoke System 2, and are highly motivated and engaged. They carefully evaluate the merits of the argument. If it is judged credible, convincing and well-constructed, the message will often change attitudes and behaviour. If the argument is found wanting, the persuasion attempt will fail. The key point is that when central route processing is initiated, the quality of your arguments matters!
- **Peripheral route processing,** the low road to persuasion, typically occurs when people are uninterested, or are distracted by other events in their lives. Rather than thinking closely about the message, they rely on cognitive shortcuts — a hallmark of System 1 - focusing on superficial features, such as messenger likability and credibility, how strongly the message is endorsed by others, and how the message makes them feel. The substantive message content is largely ignored.

The low road to persuasion is generally much easier than the high road. Emotionally engaging content that is dramatic, novel or surprising can grab your audience's attention. With disengaged audiences, sometimes you simply need to select a likeable messenger or find a frame that generates a positive emotional response. The quality of your argument doesn't matter.

However, low-road strategies have their costs. Relative to central processing (high road), peripheral processing (low road) creates weaker and shorter-term attitude and behaviour change. What you gain in implementation, you often lose in impact. Easy come, easy go.

Caution is also necessary with System 1 strategies that create negative emotions. 'Emotional numbing', where people get burnt out by repeated bad news stories, often results in despair and behavioural disengagement. Evidence also suggests that people are limited in the number of things they can worry about — known as a 'finite pool of worry'. If landholders are already stressed about personal finance or drought, more negative emotions will probably fail to engage them.

Finally, broader moral considerations should be considered. Invasive animal control is a complex social and economic issue that deserves significant attention from property owners and other stakeholders. Don't get us wrong. We definitely see merit in System 1 for gaining audience attention, and nudging people towards desirable behaviour. However, invasive animal communicators should not rely exclusively on System 1. We strongly believe that communicators should take the high road to persuasion.

It is not good enough to change attitudes and behaviours through emotionally engaging, but intellectually empty, communications. We must understand audience motivation (see section 3), select message frames that resonate with them (see section 4), and, perhaps most importantly, craft strong, well-reasoned arguments for IA CRC recommended practices. To achieve long-term, sustained change, people must be genuinely persuaded about why these changes are desirable and important.

Key recommendations

1. Whenever possible, employ high-road strategies for persuasion. Understand your audience, choose engaging frames, and construct strong arguments that encourage System 2 (rational) processing.
2. Avoid relying exclusively on low-road strategies designed to engage System 1 (experiential) processing. We recommend System 1 strategies such as selecting likable communicators and eliciting positive emotions. But these strategies should be integrated with high-road strategies that build the case for attitude and behaviour change.

Further reading

Kahneman, D (2011). *Thinking, Fast and Slow.* Farrar, Straus and Giroux.

Petty, RE & Caccioppo, JT (1981). *Attitudes and persuasion: Classic and contemporary perspectives.* Dubuque, IA: William C. Brown.

Presenting communications in story form can engage audiences in a fundamentally deeper way than standard scientific writing.

ten

Telling a story to engage your audience

> Storytelling is the essential human activity. The harder the situation, the more essential it is. · *Tim O'Brien*

There is an old saying — "A good story never dies." Walter Fisher (1989) proposed that humans experience and comprehend life as a series of ongoing narratives — stories with characters, conflicts, beginnings and endings. Fisher rejected the view that people are rational beings that make decisions based on evidence and the logical consistency of arguments. Rather, we choose to believe stories that best match our values and pre-existing beliefs. Invasive animal communicators can capitalise on these tendencies by:

- Understanding the values and beliefs of their target audiences (see section 3 on knowing your audience), and
- Reframing scientific findings and recommended practices into narratives that tap into these values and beliefs.

The narrative approach allows communicators to unleash their creative instincts and emotionally engage their audiences through compelling characters and storylines.

Recent neuroscience indicates that people's brains react similarly when reading about an experience and actually living the experience (Mar, 2011). This suggests that stories can engage audiences in a fundamentally deeper way than standard scientific writing.

Metaphors

A metaphor is a figure of speech in which two concepts are linked by comparison — for example the spread of cane toads within Australia has been described as a "fearless army on the march". Metaphors can be highly persuasive because they shape how people think about and understand information.

You can think of metaphors as a powerful comparative frame. For example, a recent study compared how different metaphors ("crime is a virus" and "crime is a beast") influenced people's preferences for addressing city crime. Although many participants could not remember the specific metaphor they read, those exposed to the beast metaphor were more likely to favour direct enforcement solutions involving punishment, whereas those exposed to the virus metaphor were more likely to prefer non-punitive, reform-based solutions — similar to treatment of an illness.

A meta-analysis by Sopory and Dillard (2002) evaluating the effectiveness of metaphors found:

- Communications using a single metaphor are more effective than multiple metaphors. Tether your *inner literary genius*, and avoid in-depth character studies and overly complex storylines. Aim for Hemingway, not Tolstoy. Simpler is often better.
- Non-extended metaphors ("Carp are like the terminators of the fish world") are more effective than extended metaphors with multiple related comparisons ("Carp are like terminators of the fish world. Like a young Arnold Schwarzenegger, they outmuscle the competition and are very difficult to terminate").
- Metaphors are most effective when presented early in a communication, so they can shape subsequent interpretations.
- Metaphors work best with familiar terminology ("Feral pigs are disease-ridden eating machines" as opposed to "*Sus scrofa* is like an E.B. White novel with an apocalyptic twist"). People must understand and relate, culturally, to the metaphor.

Invasive animals communicators should choose metaphors carefully to avoid unintentional positive associations. For example, a recent article in the UK edition of *The Spectator* described feral pigs as "kings of the forest" — far different from the opinion of most animal control officers.

Narrative approach: A tale about cane toads

Nigel Turvey's (2013) recent book, *Cane toads: A tale of sugar, politics and flawed science*, is a good example of the narrative approach applied to invasive animal issues.

The book tells a compelling story about how the cane toad was introduced as a bio-control agent in 138 countries growing sugar cane, and has now become one the world's most damaging invasive species.

As Turvey notes: "This story is about good intentions, unintended consequences and of simple acts leading to catastrophic outcomes. It is about scientists so committed to solving a problem, serving their country, their leaders and the industry that employed them, that they are blinkered to adverse impacts. There are lessons to learn from the toad's tale. And as the tale shows, we still come perilously close to repeating the mistakes of the past."

Key recommendations

1. Where appropriate, present information as a story with a clear beginning, middle and ending. Use imagery to illustrate the central themes.
2. Select storylines that match your audience's values and beliefs. Make sure you know your audience (section 3) before imposing your 'inner literary genius' on the world.
3. Carefully choose metaphors to help shape audience understanding. If resources are available, run a public workshop process to generate metaphors that have meaning for your target audience. If resources are tight, consider bribing your colleagues — coffee and doughnuts usually do the trick — to attend a 'literary devices exploration' session.

Further reading

Fisher, WR (1989). *Human Communication as Narration: Toward a Philosophy of Reason, Value, and Action. Columbia:* University of South Carolina Press.

Mar, RA (2011). The neural bases of social cognition and story comprehension. *Annual Review of Psychology*, 62, 103–134.

Sopory, P & Dillard, J (2002). The persuasive effects of metaphor: A meta-analysis. *Human Communication Research*, 28/3, 482-419.

Impeccably crafted and logically coherent counter-arguments will make academics swoon, but not so much those outside the ivory tower.

eleven

Debunking myths and misinformation

> Education should prepare our minds to use its own powers of reason and conception rather than filling it with the accumulated misconceptions of the past. · *Bryant McGill*

Landholders often hold very strong beliefs about invasive animals. Some of these beliefs are true. Some are not. For example, despite considerable evidence to the contrary, many people believe there are no foxes in Tasmania, and that fox-control programs in the state are a waste of money.

Debunking myths and misinformation requires more than accurate information. Indeed, it is incredibly easy to design education campaigns that inadvertently reinforce the myths you are trying to correct. To debunk effectively, we must understand how people process new information, how existing knowledge is modified, and how current worldviews and beliefs can undermine rational, clear thinking.

Cook and Lewandowsky (2011) have developed an excellent handbook on debunking climate change myths and misinformation. In this section, we summarise their main principles and recommendations, and highlight possible applications to invasive animals.

Avoiding backfire effects

Many debunking attempts not only fail, but backfire spectacularly by strengthening pre-existing misinformation. Let's review some of the common pitfalls of debunking and how to avoid them.

Familiarity backfire effect. When debunking a myth, communicators often place the myth front and centre in their messages. For example: "New Study Questions Locals' Beliefs that Foxes do not Exist in Tasmania".

When the myth is repeated, it becomes more familiar. And the more familiar the myth, the more likely it will be believed. If people repeatedly hear that many Tasmanians believe that foxes do not exist in the state, they are more likely to accept the myth as true.

To prevent familiarity backfire effects, Cook and Lewandowsky recommend avoiding the myth entirely. In situations where 'ignoring the myth' is not practical, they recommend leading with a core fact, followed immediately by strong supporting evidence. The myth should only be acknowledged after the correct information has been provided.

When myths are directly acknowledged, provide a clear explanation about why the misinformation is incorrect or misleading. It is very important that the debunking process does not leave a gap; the misinformation must be replaced by a plausible alternative.

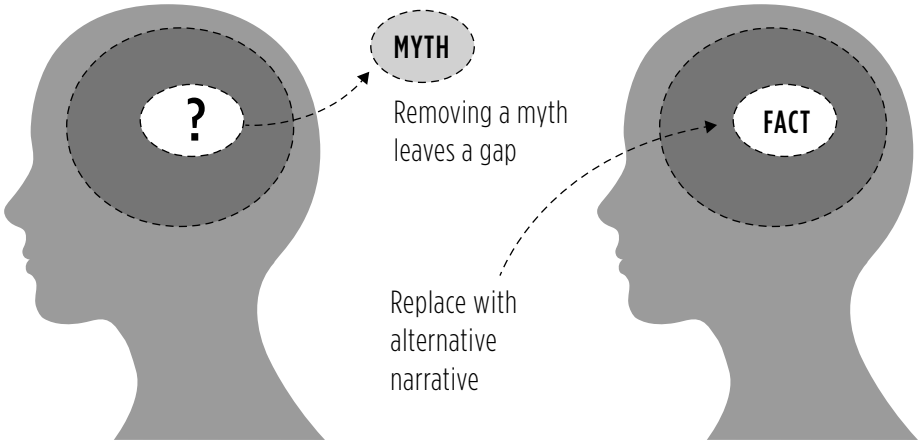

Figure 4: When debunking make sure you fill the knowledge gap. Source: Cook & Lewandowsky (2011).

Overkill backfire effect. When debunking a myth, communicators often feel compelled to comprehensively list counter-arguments. Much like repeating a myth, this too can be a mistake. Impeccably crafted and logically coherent counter-arguments will make academics swoon, but not so much those outside the ivory tower. Most people prefer, and are more likely to believe, messages that are concise, engaging and easy to understand. Unfortunately, this means people sometimes prefer a simple myth to a more complicated truth.

Cook and Lewandowsky recommend that communicators keep their messages lean, mean and easy to comprehend. Sentences and paragraphs should be short and sharp, and images should be used liberally to reinforce core facts and arguments. The bottom line: use few words, lots of pictures and keep it simple.

Worldview backfire effect. Much to the dismay of economists, most of us fail to meet the 'rational ideal' when deciding how to act. Considerable evidence exists that our pre-existing worldviews lead us to unconsciously process new information in biased ways. This means that attempts to 'educate the public' about invasives will often have no effect, or make people even more committed to their original views.

Two cognitive processes contribute to this effect. First, people tend to selectively seek out information that reinforces their prior beliefs; this is known as *confirmation bias*. People who believe that foxes don't exist in Tasmania generally don't seek out information to the contrary. They tend to gravitate to news stories, blogs and social media that 'confirms' their view.

Second, when people confront a message that counters a strongly held belief, they tend to devote significant time and effort to developing opposing arguments. We see this in the climate change debate, where a simple documentable claim such as, "97% of climate scientists believe that human activity is contributing to global warming" is met with series of detailed and complex rebuttals.

Worldview backfire effects are strongest amongst those with strong beliefs. This highlights the importance of segmenting your audience while developing a communication strategy. Sometimes it will be very difficult — if not impossible — to sway groups with very entrenched views. And it may be more cost-effective to engage segments that are undecided or hold moderate views.

When entrenched groups must be engaged, use message frames that are broadly consistent with their worldviews. For example, for groups who do not value the environment, frame outcomes in terms of community benefits (local jobs) and national interests (strengthening the economy).

An example of Cook and Lewandowsky's debunking principles, applied to feral pig management, is presented in Table 3.

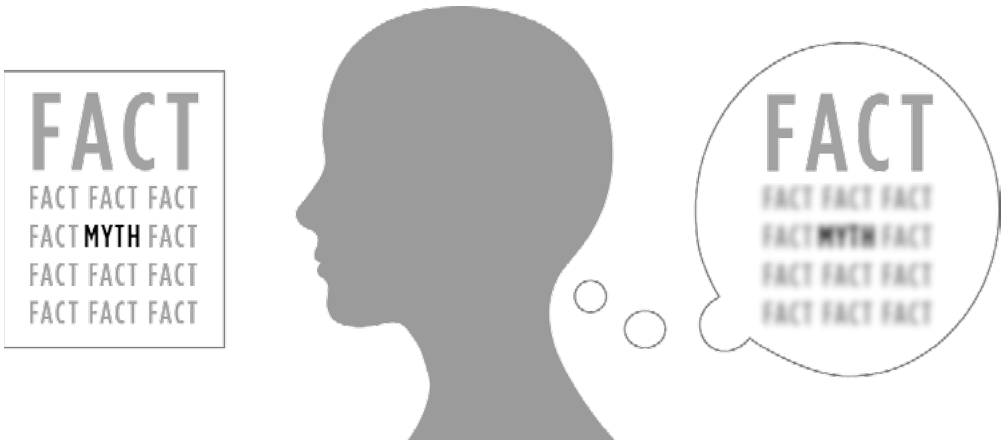

Figure 5: Emphasise your key facts, *not* the myth. Source: Cook & Lewandowsky (2011).

Table 3: Debunking a common feral pig myth

Core fact emphasised in headline	The home range of feral pigs depends on the availability of food, water and shelter.
Core facts reinforced in initial text	Comprehensive ecological and biological research over the last four decades, including radio-tracking studies that monitor the movements of collared pigs (e.g., Mitchell et al., 2009), has conclusively shown that food, water and shelter drive feral pig habitat selection.
Explicit cue to reader that misinformation is forthcoming	Despite overwhelming scientific evidence to the contrary, some land managers continue to claim that feral pigs could not possibly be living on their property.
Myth	They maintain that the pigs damaging their crops live in neighbouring national parks and other government-owned conservation areas, which serve as breeding grounds.
Explaining how myth misleads	Many land managers mistakenly believe that if pigs aren't sighted on a property during the day, they must not live on that property. However, feral pigs rest most of the day in secluded areas, making them difficult to spot. Despite what land managers believe, radio-tracking studies indicate that pigs are often living right under their noses.

Mitchell, J, Dorney, W, Mayer, R & McIlroy, J. (2009) Migration of feral pigs (*Sus scrofa*) in rainforests of north Queensland: fact or fiction? *Wildlife Research*, 36, 110–116. http://dx.doi.org/10.1071/WR06066

Key recommendations

1. Emphasise *your* facts. Where possible, *don't* repeat the myth.
2. When directly addressing myths, make sure misinformation is accompanied by an explanation about why it is incorrect or misleading.
3. Keep your messages simple and easy to comprehend. Use graphics and avoid overly comprehensive rebuttals.
4. For entrenched groups, select message frames that match pre-existing worldviews and beliefs.
5. Visit Skeptical Science (www.skepticalscience.com). This website provides useful examples of debunking applied to climate change. But most of the basic principles will generalise to other areas.

Further reading

Cook, J & Lewandowsky, S (2011). *The debunking handbook*, University of Queensland, St. Lucia, Australia.

Ensure your tools match the specific behaviours you are trying to change.

twelve

Matching strategy to perceived benefits and barriers

Unless social sciences can be as creative as natural science, our new tools are not likely to be of much use to us.
· *Edgar Douglas Adrian*

Although a broad range of communication and behaviour change tools exists, not all tools are suited for all situations. You can increase efficiency and impact by matching tools to the specific behaviours you are attempting to change.

Schultz (2014) provides a simple framework for selecting intervention tools based on perceived benefits and barriers of the target behaviour. We'll focus on Schultz's model in this section.

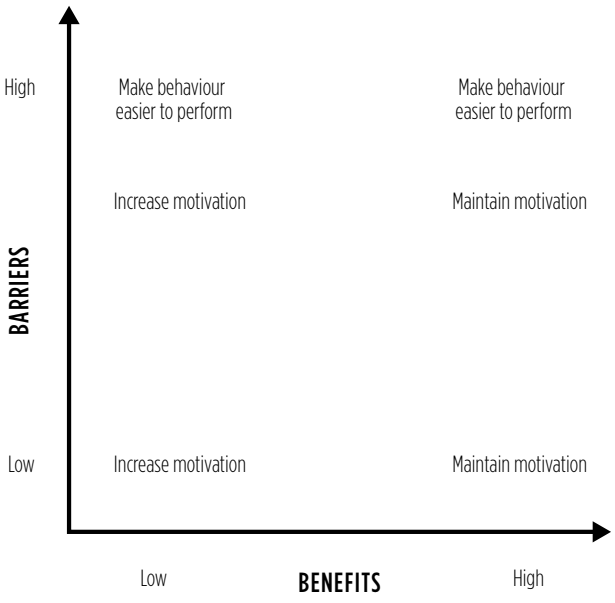

Figure 6: Select communication and behaviour change tools that match the barriers and benefits profile of the behaviour you want to change. Adapted from Schultz (2014).

For the truly bold, Michie and her colleagues (2011) have developed a more sophisticated 'behaviour change wheel' for linking policies, to intervention types, to specific drivers of behaviour.

When perceived benefits and barriers are low, the target behaviour is relatively easy to perform and no substantial barriers exist. However, because people see few benefits in the behaviour, motivation for change is quite low. Thus, to promote behaviour change, you should boost this motivation.

- One way to increase motivation is to educate your audience about the benefits of engaging in the behaviour. Sometimes these benefits are clear but people are not aware of them. For example, if you were encouraging people to keep their cats contained, you could highlight how containment substantially decreases the chances of their cat being injured or killed. Keeping a beloved pet healthy is an important motivator for most people.
- Another simple way to boost motivation in low-barrier contexts is to provide normative feedback (see section 7). Showing how the majority of the community is concerned about and engaged in animal control practices will generate social pressure for others to follow suit.

When perceived benefits are high and barriers are low, the target behaviour is once again easy to perform and now the audience is highly motivated. In this situation, a large proportion of people might already be performing the behaviour. As a result, your goal may be to maintain motivation for an existing behaviour and/or encourage new related behaviours. Several strategies are worth considering:

- Provide educational materials about new animal control strategies and technologies. Sometimes you'll be lucky enough to deal with highly motivated, well informed individuals who want to act responsibly. They often embrace the latest control strategies and technologies, and sometimes will volunteer for pilot tests to assess effectiveness. These highly motivated and informed types often make very good messengers (see section 4).
- Provide memory prompts for repeating management and control behaviours such as baiting, cat containment, free-feeding, checking for re-opened warrens, monitoring pest levels and keeping updated with training.
- Provide feedback about personal contributions and overall progress towards goals. In citizen science fox monitoring programs, for example, feedback could detail the number of fox sightings in the past 3 months, who reported them and where.

When perceived benefits are high and barriers are high, the audience is motivated to adopt the behaviour, but substantial obstacles limit progress. In this context, the best strategy is to make it easier to perform the behaviour.

- If lack of knowledge about specific animal control strategies is the main obstacle, deliver persuasive educational materials in a readily accessible format (e.g., video instructions delivered through phone apps).
- If purchasing bait is inconvenient or expensive, explore alternative delivery and subsidisation systems.
- Where structural changes to remove barriers are not possible, but motivation is high, the best strategy may be to get verbal and written commitments. For example, you could ask landholders to sign a pledge card to bait at a pre-determined time of the year. As noted earlier, commitments work best with audiences that are already motivated.

Finally, **when perceived benefits are low and barriers are high,** the target behaviour is difficult to perform and the audience sees no reason for change. This is the most challenging situation for communication professionals but is no time to throw in the towel. Several approaches are still worth trying:

- If rapid change is required and sufficient resources are available, consider incentives. For example, financial bonuses for adopting new control technologies may increase motivation and decrease financial barriers. When considering incentives, keep in mind that although they can create rapid behaviour change, they rarely change intrinsic motivation. When the incentive is removed (e.g., provision of free toxic baits), behaviour often reverts back to pre-intervention levels. Generous incentive schemes can also cause cost blowouts. For example, feed-in tariffs that allow residents to sell renewable energy back to the grid at inflated prices can lead to rapid, widespread adoption, quickly exhausting funding.
- Schultz (2014) suggests that competitions may be effective in low-benefit high-barrier contexts. Pitting different regions or communities against each other to compete for prizes related to invasive animal management can increase participation. And more importantly, evidence suggests that the behaviour change created by competitions is strongest for those who were initially less motivated. One drawback of competitions, like incentives, is that behaviour often reverts back to pre-intervention levels after the competition ends. A second drawback is that competitions may prime extrinsic values, which in turn can suppress values related to community and environmental concern (see section 6).
- Because of the limitations of incentives and competitions, the best option in low-benefit high-barrier contexts may be long-term experimentation and continuous learning. That means systematically introducing interventions to increase benefits and decrease barriers - both individually and in combination – and evaluating the results. Over time this will likely produce positive change. If outcomes are properly recorded it will also generate a cumulative knowledge base to help you and your successors choose interventions in various situations. We will say more about systematic experimentation and evaluation in the next section.

Patterns of benefits and barriers shift over time

We've argued that practitioners should select behaviour change strategies based on the pattern of benefits and barriers present in a situation. For example, when people perceive few benefits associated with a new bait or poison delivery system, practitioners should deliver communications that boost motivation. When barriers are present, practitioners should make the desired behaviour easier to perform.

However, it is also important to appreciate that patterns of benefits and barriers often shift over time as people move through the change process (see "Segmenting on stages of change" in Chapter 3). People who are not aware that a "wild dog problem" exists have a very different benefit/barrier profile than those who recognise the problem and are in the process of adopting new management practices.

It is important for invasive animal communicators to know where their audience is in the change process, and to adjust their strategies to account for unique patterns of benefits and barriers that might be associated with each stage of change.

Key recommendations

1. Conduct an initial benefits and barriers analysis to determine which behaviour change tools to use.
2. Where perceived benefits of the target behaviour are low, use tools that increase motivation.
3. Where perceived barriers are high, use tools that make it easier to engage in the target behaviour.
4. Where benefits are low and barriers are high, consider incentives or competitions. But use caution because these approaches can be expensive and do not produce long-term behaviour change.

Further reading

Michie, S, van Stralen, MM, & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6:42.

Schultz, PW (2014). Strategies for promoting pro-environmental behaviour: Lots of tools but few instructions. *European Psychologist,* 19, 107-117.

We rarely have useful information about whether campaigns have changed actual behaviours or improved environmental outcomes.

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Evaluation: Determining what works and why

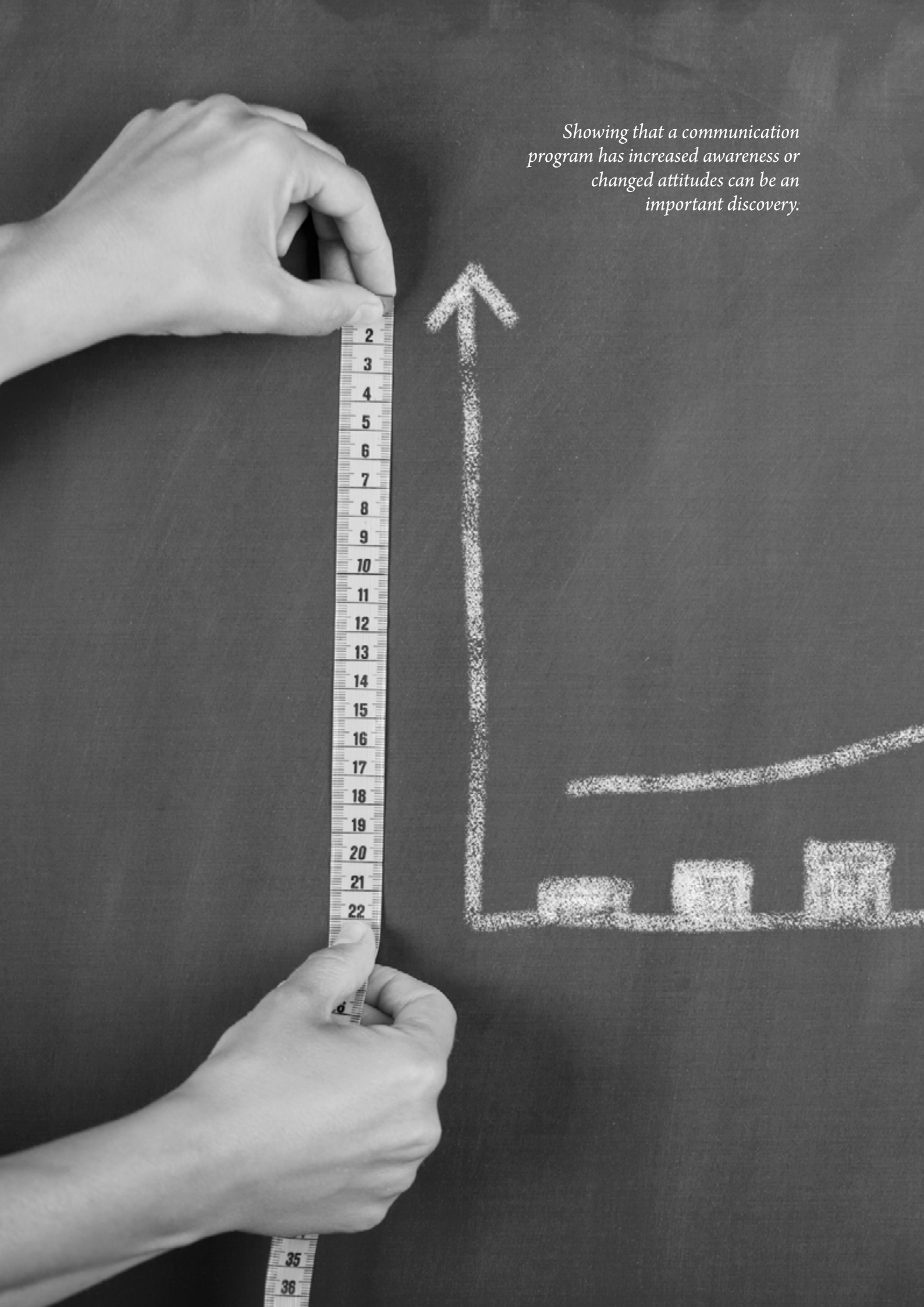
> Science is a way of thinking, more than a body of knowledge. · *Carl Sagan*

Millions of dollars are spent each year developing and distributing materials to engage the public about natural resource management. Despite this substantial investment, we rarely have useful information about whether campaigns have changed actual behaviours or improved environmental outcomes.

This is unsatisfactory but preventable; communicators must build evaluation plans at the beginning of their projects.

When attempting to determine what works and why, methods matter! Here are a few principles to keep in mind when developing an evaluation plan.

- **Always include a control group.** Imagine you develop a fancy new smartphone app for reporting invasive animal sightings. You release the app and note that reported sightings increase by 10% relative to last year. Most people would attribute this 10% increase to your app. However, in the absence of control group — a comparison group that did not receive the app — it's impossible to know whether the increase is due to the app or an infinite number of other uncontrolled factors (e.g., an increase in the overall number of invasive animals, an increase in public interest in invasive animals driven by media reports, etc.).
- **Whenever possible, use random assignment.** Randomised controlled trials (RCTs) represent the gold standard for evaluating a treatment or project. RCTs are the method of choice in the medical sciences to evaluate pharmaceuticals and other treatments. The same principles can apply to evaluating communications and behaviour change strategies. Make a list of all the individuals, households or communities in your study, and then use a random number generator (e.g., randomizer.org) to assign each to either a treatment or control (no treatment) condition. This makes your treatment and control groups as similar as possible before delivering the communication intervention. As a result, following the intervention, any observed differences between the treatment and control groups should be attributable to the communication, and not to pre-existing group differences or other uncontrolled factors.
- **When random assignment is not possible, use quasi-experimental designs.** Quasi-experiments compare naturally occurring or self-selected groups. For example, if you launch a community wide communication campaign about managing domestic cats, you could compare cat management practices between those who viewed your communications and those who did not. Compared to a randomized control experiment, quasi-experimental designs won't give you the same level of confidence that your communication program was the main factor driving behaviour change. But in most cases, having imperfect evidence is better than having no evidence. Shadish, Cook and Campbell (2002) provide an excellent overview of designs for a wide range of contexts.
- **Use statistical tests to evaluate effects.** In some situations, it is blindingly obvious that a communication program is effective. For example, if you find that baiting rates have increased by 80% in the treatment group compared to only 10% in the control, you can be fairly confident you're on to something good. Unfortunately, many studies produce



Showing that a communication program has increased awareness or changed attitudes can be an important discovery.

results that are far less clear-cut. What if you found that your communication program resulted in a 10% increase in baiting versus 5% for the control group? Would this be a meaningful difference, or simply due to chance variation? Statistical tests help you decide which differences are 'real' and which are likely chance. If you are unfamiliar with the many tests and software options available, consult a qualified statistician, within your organisation or at a local university. Remember to factor in data analysis costs when developing project budgets.

- **Measure actual behaviour change.** Showing that a communication program has increased awareness or changed attitudes can be an important discovery. But remember — changes in awareness and attitudes don't always translate into behaviour change. Thus, where possible, measure behaviours directly, in addition to awareness and attitudes. Also note that self-reported behaviour, based on survey responses, is sometimes unreliable. People's actions don't always match their claims. Therefore, where possible, undertake direct observation of desired invasive animal management practices.
- **Link behaviour change to on-the-ground impacts.** People working in invasive animal management sometimes assume that getting landholders to adopt recommended pest management practices will automatically deliver benefits like increased biodiversity, reduced stock losses, etc. Where possible, assess these assumptions. If you get an 80% increase in baiting within a community, but no short- or medium-term reduction in stock loss, something may be amiss. Perhaps the original assumption, linking the targeted behaviour to stock loss, was incorrect. Perhaps other unanticipated factors are at play. Investigation is required.
- **Evaluate the cost-effectiveness of interventions.** Resources are almost always limited. It is rarely practical to develop a Rolls Royce communication strategy on a Kia budget. So not only is it important to measure success with behaviour change and environmental impact, it's also important to calculate 'return on investment' (ROI) — that is, overall benefit per dollar spent. ROI calculations can help you choose between competing communication strategies. If one strategy is almost as effective as another, but costs substantially less, it may jump to the front of the queue as the preferred option.
- **Embrace continuous learning.** Communication programs that fail to change behaviour or reduce pest levels should not generate feelings of shame or be swept under the carpet. All outcomes from well-designed studies are informative. If your project didn't work as planned, consult relevant stakeholders, review your practices, delve into relevant theories and methodologies, and try again. **Rethink, reapply and re-evaluate.** Solutions to Australia's invasive animal problems will not appear overnight. A systematic, long-term, scientific program of action is required, in which we incrementally increase our knowledge about what works and what doesn't. This commitment to continuous learning and improvement is necessary for both ecological and human dimensions research.

Key recommendations

1. Evaluate the effectiveness of your communications against your program goals.
2. Use rigorous methods to determine whether your program works, including: treatment and control groups, random assignment, and statistical tests to rule out chance as an explanation for your results.
3. Assess the impact of communications on behaviour (not just awareness or attitudes), and where possible link behaviour change to environmental impacts.
4. Evaluate the effectiveness and cost-effectiveness (ROI) of interventions.
5. Adopt a scientific mindset, where evaluation results — both successes and failures — contribute to a loop of continuous learning and improvement.

Further reading

McKenzie-Mohr, D (2011). *Step 4: Piloting.* In *Fostering sustainable behaviour: An introduction to community based social marketing.* Gabriola Island: New Society Publishers. www.cbsm.com

Murnane, RJ & Willett, JB (2010). *Methods matter: Improving causal inference in educational and social science research.* New York: Oxford University Press.

Shadish, W, Cook, TD, & Campbell, DT (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston: Houghton Mifflin.

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Key source references and general further reading

Several key references formed the initial foundation and inspiration for this manual. We refer the reader to the following:

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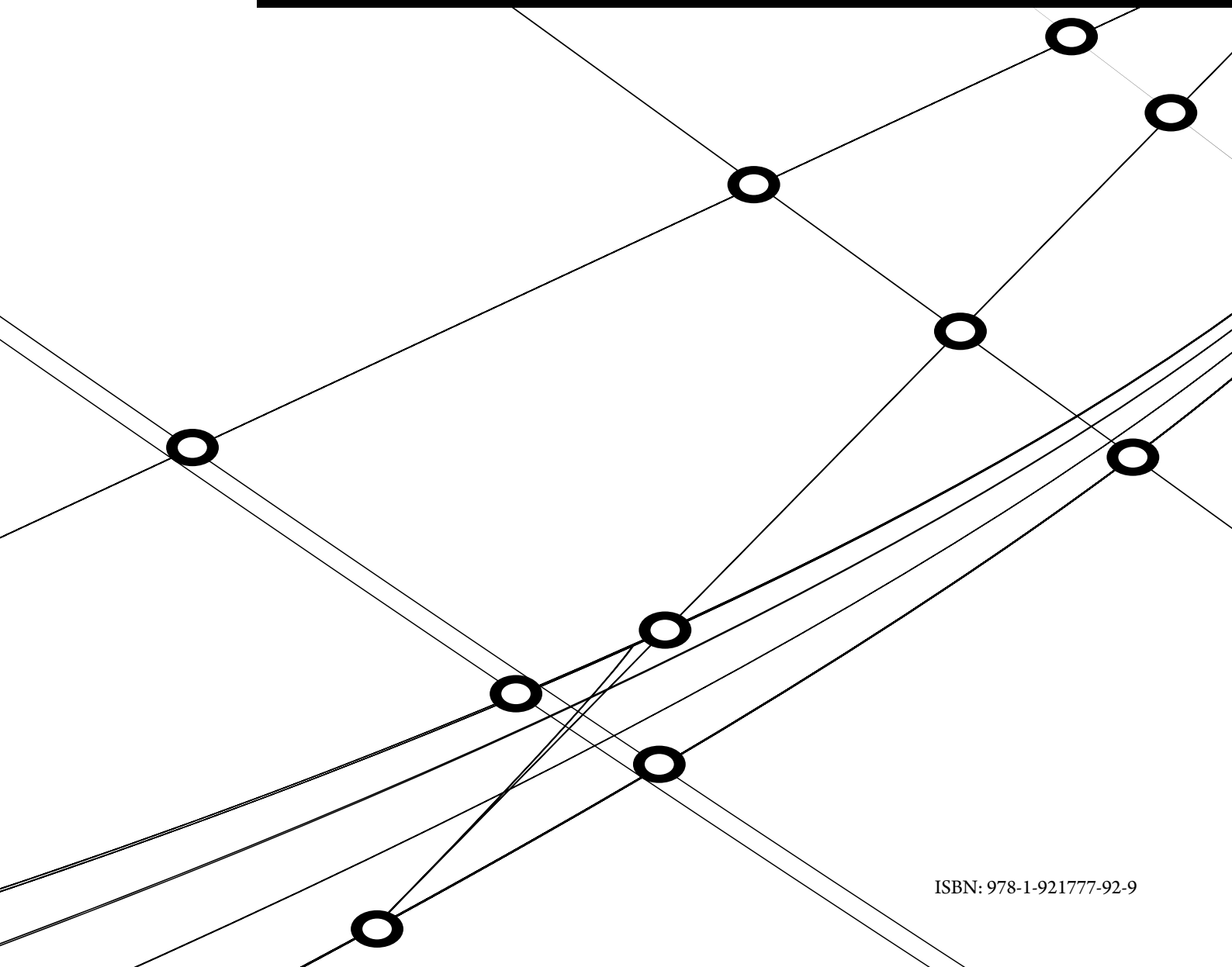
Scarlett, L Boyd, J Brittain, A with Shabman, L and Brennan T (2013). *Catalysts for Conservation.* Resources for the Future, Centre for the Management of Ecological Wealth, Washington D.C. http://www.rff.org/centers/management_of_ecological_wealth/Pages/Catalysts-for-Conservation.aspx

"Behaviourally Effective Communications for Invasive Animals Management: A Practical Guide" introduces principles from the behavioural sciences for developing more effective communication strategies. A key feature of the guide involves explicitly linking communication goals to behaviour change.

This book is intended for natural resource management organisations and practitioners that communicate with the general public and interested stakeholders about the management of invasive animals.



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