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The human contribution to animal welfare

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Human-animal relationship

With an ever-increasing body of evidence, the profound effects of **human interactions on farm animal fear and stress responses**, there has been a widespread appreciation of the importance of **human-animal relationships on animal productivity and welfare**

The application of two psychological principles facilitated the development of an integrated model relating human characteristics to welfare and productivity outcomes in livestock:

1. Ajzen and Fishbein's theories of **Reasoned Action and Planned Behaviour** (TPB); predict human behaviour from behaviour-specific attitudes (Ajzen and Fishbein, 1980)
2. **Cognitive behavioural interventions**; to effect behavioural change (Ajzen and Fishbein, 1980; Hemsworth and Coleman, 2011)

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The Theory of Planned Behaviour (Ajzen, 1988)

The greatest influence on human behaviour remains **the attitude an individual possesses towards performing the behaviour**

Behavioural intention is the product of **3 specific cognitive elements**: *attitude towards the behaviour, subjective norms, and perceived behavioural control*

1. **Attitude towards the behaviour**: is a personal evaluation of the behaviour and its outcomes as +ve or -ve
2. **Subjective norms**: the individual's perception of social pressures combined with their inclination to comply with such pressures
3. **Perceived behavioural control**: the perceived level of difficulty in performing the behaviour and the extent to which the individual has control over achieving the behaviour

Figure 1. The Theory of Planned Behaviour (Ajzen, 1988)

The relative importance of the 3 elements will vary across situations and behaviours

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The Theory of Planned Behaviour (Ajzen, 1988)

The **3 attitudinal factors** are a direct product of their associated salient beliefs: *behavioural beliefs, normative beliefs, and control beliefs*

1. **Behavioural beliefs**: beliefs about how the behaviour in question relates to particular outcomes
2. **Normative beliefs**: beliefs about how other people whose opinions matter to them would expect them to behave
3. **Control beliefs**: beliefs about any factors that affect their control over successfully performing the behaviour (internal and external)

Figure 2. Theory of Planned Behaviour with the precursors to attitudes (Adapted by Hemsworth and Coleman, 2011, from Albarracín et al., 2005)

Attitudes cannot be directly measured, but can be inferred from a person's responses to statements regarding these salient beliefs (Hemsworth and Coleman, 2011)

- a person's intention to perform a specific behaviour could in theory be predicted from their responses to belief statements that target these three types of beliefs

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Cognitive-behavioural training

Cognitive-behavioural techniques basically involve retraining people;

First, by targeting the beliefs that **underlie their behaviour** (attitudes) and the **behaviour in question**; and

Secondly, by **maintaining** these changed beliefs and behaviours

The process of **inducing behavioural change** is a complex and involves:

- Imparting knowledge and skills,
- Changing established habits,
- Addressing commonly perceived barriers to change,
- Addressing defensiveness about previous behaviour,
- Providing follow up to reinforce change,
- **As well as actually changing the relevant beliefs (attitudes and behaviour)**

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Past research: Human-animal relationship in livestock

Development of an integrated model relating human characteristics to welfare and productivity outcomes in livestock

Figure 3. A model of human-animal interactions in the livestock industries (Hemsworth and Coleman, 2011)

Past research: HAR in livestock

A substantial body of work has applied these principles in farm animal settings and supports the predictive value of beliefs and attitudes in animal management behaviour (Hemsworth and Coleman, 2011)

- Studies with pigs, broiler chickens, laying hens, and dairy cattle have found that the **attitudes of stockpeople towards handling livestock**, as measured by a series of belief statements, **reliably predict stockperson handling behaviour**
 - *Negative attitudes* towards interacting with these animals are correlated with *negative handling behaviours*
 - *Positive attitudes* towards interacting with these animals are correlated with *positive handling behaviours*

Studies in the dairy and pork industries (Hemsworth et al., 1994; Coleman et al., 2000; Hemsworth et al., 2002) have shown that **cognitive-behavioural training** can:

- successfully improve the attitudes and behaviour of stockpeople towards their animals, with
- consequent beneficial effects on animal stress, **welfare** and productivity



Past research: HAR in livestock

An intervention study – establishing causality and validating training in the pig industry (Hemsworth et al., 1994)

Two treatments were imposed:

- Intervention: a cognitive-behavioural intervention procedure, targeting key stockperson attitudes and behaviour
- Control: no intervention was attempted

Measures taken:

- Stockperson attitudes: salient beliefs about handling pigs
- Stockperson behaviours: number and percentage of –ve tactile behaviours
- Animal behaviour: behavioural response to humans
- Animal productivity: piglet/sow/year



Past research: HAR in livestock

Analysis of covariance

Variable	Farms	
	Control	Intervention
Stockpeople Attitudes		
Beliefs about petting	89.2 ^a	102.9 ^b
Stockpeople behaviour		
-ve behaviour (%)	55.8 ^y	38.6 ^x



Past research: HAR in livestock

Analysis of covariance

Variable	Farms	
	Control	Intervention
Pig behaviour		
Time near experimenter (s)	15.6 ^a	21.9 ^b
Pig productivity		
Piglets born/sow/year	22.2	23.8



Past research: HAR in livestock

Relationships between handling, behaviour and stress in lambs at abattoirs (Hemsworth et al., in press)

Relationships between lamb behavioural and physiological variables on farm, stockperson, dog and lamb behavioural variables pre-slaughter and plasma cortisol, glucose and lactate in lambs post-slaughter were studied in 400 lambs

Stockperson (fast locomotion and lifting/pulling lambs) and dog behavioural (lunging and barking at the lamb) variables, as well as lamb variables both on-farm and pre-slaughter, accounted for 33%, 34% and 44% of the **variance in (stress) plasma cortisol, glucose and lactate concentrations post-slaughter**, respectively.

These relationships support the well-demonstrated effect of handling on fear and stress responses in livestock, and highlight the potential of training stockpeople to reduce fear and stress in sheep at abattoirs



Past research: HAR in recreational horse ownership

An observation-based investigation into the human-horse relationship and the antecedents of recreational horse owner husbandry behaviour, as depicted by the hypothesized model (Hemsworth et al., 2011)

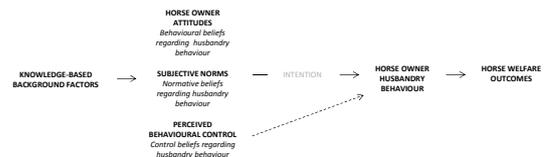


Figure 4. The hypothesised sequential relationships between horse owner attributes in the human-horse relationship, and the ensuing relationship with horse welfare outcomes



Past research: HAR in recreational horse ownership

DATA ANALYSIS

1. Pearson product-moment correlations examined associations between horse owner attributes and horse welfare outcomes
2. Linear regression analyses were used to investigate the human-horse relationship and the antecedents of recreational horse owner behaviour.

1. Victorian recreational horse owner attributes were associated with horse welfare outcomes



Figure 5. The proposed sequential relationships between horse owner attributes in the human-horse relationship, and the ensuing relationship with horse welfare outcomes

2. The human-horse relationship can be explained by a sequential attitude-behaviour relationship

- horse owner salient beliefs about husbandry behaviour appear to function as antecedents of horse owner husbandry behaviour
- favourable beliefs were significantly associated with the appropriate performance of all three behaviours
- inappropriate performance of all three behaviours was significantly correlated with poor horse welfare outcomes ($p < 0.05$)



Past research: HAR in recreational horse ownership

Table 1. Output for linear regression analysis between horse owner husbandry behaviour and horse owner beliefs regarding husbandry behaviour in H1

Horse owner husbandry behaviour	Salient belief variable	Zero-order correlation	β coefficient	Standard error	Adjusted R ²	P-value
Parasite control	Attitude towards behaviour	-0.49	-0.49	1.14	0.22	<0.01
	Subjective norm	0.26	-0.11	1.15	-0.003	0.49
	Perceived behavioural control	0.54	0.50	1.08	0.07	0.01
Hoof care	Attitude towards behaviour	0.67	0.67	0.87	0.44	<0.01
	Subjective norm	0.34	0.04	0.88	-0.001	0.72
	Perceived behavioural control	0.64	0.28	0.87	0.01	0.96
Dental care	Attitude towards behaviour	0.29	0.29	0.78	0.07	0.03
	Subjective norm	0.12	-0.02	0.79	-0.01	0.90
	Perceived behavioural control	0.48	0.45	0.71	0.18	<0.01

Parasite control behaviour

Attitude towards behaviour is accounting for 22% of the observed variation in parasite control behaviour

Perceived behavioural control is accounting for 7% of the observed variation in parasite control behaviour

Hoof care behaviour

Attitude towards behaviour is accounting for 44% of the observed variation in hoof care behaviour

Dental care behaviour

Attitude towards behaviour is accounting for 7% of the observed variation in dental care behaviour

Perceived behavioural control is accounting for 18% of the observed variation in dental care behaviour



Past research: HAR in recreational horse ownership

Evidence of relationships between horse owner attributes and horse welfare outcomes, in accordance with TPB, and human-animal relationship research conducted within the livestock industries (Hemsworth & Coleman, 2011)



Figure 6. The proposed sequential relationships between horse owner attributes in the human-horse relationship, and the ensuing relationship with horse welfare outcomes

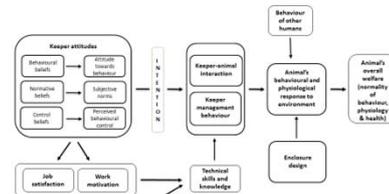
These findings indicate the potential to:

- **predict** a horse owner's husbandry and management behaviour from their attitude towards the behaviour in question
- **modify** the husbandry and management behaviour of horse owners by targeting their attitudes towards the behaviour, and subsequently encourage positive horse welfare outcomes

These relationships are purely observational and therefore can not be interpreted as causal. They do however provide a basis for further experimental research investigating the human behavioural aspect of the human-horse relationship, and the subsequent impact on horse welfare



A model of HAR in zoos



Current research

Zoo keeper-zoo animal relationships: variation in keeper attitudes and behaviour

Pilot study examining variation in meerkat keepers attitudes (and other work-related characteristics) and behaviour (interactions and management behaviour)

- Direct behavioural observations at morning inspection

Time in enclosure		Time within 1 m	
Keeper	Mean	Keeper	Mean
1	9.00	1	0.32
2	21.00	2	0.10
3	12.00	3	0.16
4	14.00	4	0.20
5	16.00	5	0.13
6	35.50	6	0.24

Time feeding		Time talking	
Keeper	Mean	Keeper	Mean
1	0.17	1	0.39
2	0.03	2	0.19
3	0.06	3	0.35
4	0.20	4	0.10
5	0.09	5	0.30
6	0.15	6	0.60



Current research

Safe Cat, Safe Wildlife: Do conservation messages at the zoo affect long-term behaviour in zoo visitors?

Preliminary data on relationships between cat owner attitudes and cat owner reported management behaviour

Keeping cats indoors (cat owner reported behaviour) significantly correlated with positive attitudes towards

- having the time to provide the cat with mental stimulation ($r = -0.44$, $P < 0.05$)
- walking the cat on a leash outdoors ($r = 0.46$, $P < 0.01$)
- keeping the cat indoors at night for safety reasons ($r = -0.60$, $P < 0.01$)
- keeping the cat indoors at night for conservation reasons ($r = -0.60$, $P < 0.01$)
- donating to native fauna conservation ($r = -0.38$, $P < 0.05$) were all significantly correlated with cats spending less time outdoors



Current research

Growing evidence showed that animals could experience positive or pleasant emotions in the presence of humans, when linked to rewarding events and associations. This work has shown that such **positive relationships with humans may ameliorate animal stress during routine husbandry practices** in agriculture (Hemsworth and Boivin, 2011)

Human enrichment program for breeding sows: proof of concept

- examining the effects of regular positive human contact on stress resilience and a positive affective state in breeding sows (i.e. positive emotional experiences to improve animal welfare)

Two treatments:

- I. Control: routine management
- II. Human enrichment: additional 2-min positive human interaction/day 

Current research

Public (community) attitudes

The public is often a key driver of animal welfare change

- public views affect decision makers at the political, regulatory, retail and industry levels
- failure to meet public expectations can lead to increased litigation, increased regulations, and increasing consumer demands all of which hamper the success of the red meat industry

Societal concerns dictate the need for animal welfare standards and animal welfare legislation, however, public attitudes about animal-use and animal welfare are often based on limited knowledge, and the public's beliefs are largely acquired from the mass media and opinion leaders 

Current research

Identifying public and producer attitudes to sheep and cattle welfare to inform education strategies

To ensure ongoing support for the red meat industry we need to identify:

- i. Community and producer **knowledge** of key practices and welfare concerns in the red meat industry
- ii. Community and producer **attitudes** towards key practices and welfare concerns in the red meat industry

Once these factors are understood, **education strategies** can be developed and implemented to provide appropriately targeted dispassionate and factual information regarding the red meat industry 

Future research

Human-Animal Relationship

- Zoo keeper-zoo animal relationships: Understanding implications of keeper attitudes (and other work-related characteristics) and behaviour (interactions and management behaviour) on zoo animal welfare
- Visitor experience, education and conservation behaviour
- Human enrichment program for pigs; continuation of current project
- HAR in laying hens (free-range)
- HAR in companion animals: dogs and horses
- Duty of care in companion animal owners
- Attitude-behaviour training programs for stockpeople in the sheep transport and abattoir sectors

Public attitudes and education

- Public attitudes to animal welfare (Pigs): potential project to monitor public attitudes towards Pork industry (and animal welfare), in order to develop community education strategies 

Conclusion

The **human component** is one of, if not, the **most important factor** in **captive animal welfare** 