Sniffing out what Australians know and believe about Drug Detector Dogs

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Abstract

The ways in which drugs are policed, differs from country to country, with Drug Detector Dogs (DDDs) a commonly used detection strategy in Australia. The effectiveness of DDDs, however, has been scrutinised by both Australian media and research. Despite this, their work and lives 'on the job' continue to be portrayed in a positive light on popular television shows such as *Border Security*. The aim of the current study was to gain an understanding of public perceptions and knowledge surrounding DDDs using both quantitative and qualitative methods, through an online convenience sample of 129 Australians. Results revealed participants believed DDDs were equally as interesting and as happy as companion dogs. However, while there was general support for both the roles that DDDs and companion dogs play in human lives, participants were relatively less supportive of the use of DDDs. Importantly, findings suggest the general community have little awareness of the lives of DDDs 'off the job', including housing and handling practices, factors that directly impact animal welfare. We suggest that greater transparency around these aspects of the dogs' lives and welfare experience be made publicly available so that the DDD industry can maintain their social license to operate.

Introduction

Understanding public perceptions regarding working dogs is important, as community attitudes and media coverage underpin social license to operate and the sustainability of working with dogs in these ways (Cobb, et al., 2020; Cobb, et al., 2021). One such group of working dogs is Drug Detection Dogs (DDDs); dogs that have been trained to search and identify various target odours, including narcotics or other drugs, on command. A cross-national analysis involving 26 countries revealed Australia as one of the top 4 countries (along with Italy, Scotland and the UK) for high frequency use of DDDs, up to 14 times more common than some other countries when controlling for individual and national factors (Hughes et al, 2018). In Australia, these dogs can be found in government agencies such as Australian Border Force (formerly Customs), Australian Federal Police, State and Territory Police, and Correctional Services. Additionally, DDDs can be found in the private sector, where companies with working dogs are contracted to provide drug detection services; for example, screening workplaces or schools as part of health and safety surveillance programs. Australian DDDs have a history of negative political and media attention with concerns for their utility, especially in certain contexts such as musical festivals and other public gatherings (Lancaster, 2017).

A 2006 New South Wales (NSW) Ombudsman report on the 'Police Powers (Drug Detection Dogs) Act 2001' (Police Powers (Drug Detection Dogs, 2001)) which monitored the use of DDDs over a two-year period, concluded that they were ineffective in detecting drug dealers. In contrast, their use has led to public searches of low-grade users or individuals not in possession of any detectible drugs (i.e. false positives) (NSW Ombudsman, 2006). Several Australian research publications have since supported the idea that DDDs are ineffective, both in terms of deterring people from using drugs, as well as their ability to detect those

concealing them (Dunn & Degenhardy, 2009; Grigg et al., 2018; Hickey et al., 2012; Malinis, 2019). Their increased presence at music festivals and public gatherings has, however, been associated with higher-risk drug use behaviours. These include concealment of drugs internally, binge consumption of drugs before arrival, panic consumption upon witnessing the DDD teams, or buying drugs from unknown dealers inside venues, as well as psychological harms associated with being targeted and searched (Grigg et al., 2018; Malinis, 2019). Furthermore, there are public concerns about canine handler officers unfairly targeting minority groups such as LGBTIQ communities (Lancaster et al., 2017).

Despite the evidence indicating low effectiveness, health-related risks and very high costs (A$9 million per year in the state of NSW alone) of training detector dogs, the policy to use detector dogs is still in place, with police having claimed near 100% effectiveness of their dogs (NSW Police Force, 2011). Fact-checking in 2020 suggested around 30% of positive indications from a DDD resulted in drugs being found (McCutchan, 2020). While Australian Labor and Liberal parties (which are the major centre-left and centre-right political parties, respectively) have shown active support the use of DDDs, the Australian Democrats (a minor centrist party), Greens (a large minor left party) and civil liberties groups have openly debated against them (Lancaster et al., 2017). Despite this negative attention, Australian DDDs have also been made popular with Australian TV shows such as '*Border Security*' and '*Customs*' (e.g. "Border Security: Australia's Front Line", 2017). These shows generally depict these dogs 'on the job', contributing little to no public awareness of their non-working lives. Similarly, this information is almost impossible to find online through government agency websites, beyond information about becoming a detection program puppy carer (Australian Border Force, 2020). Hence, while establishing community perceptions about these dogs is critical, it is also important to gain an understanding of the knowledge base that

the general public has about these dogs in terms of their recruitment, training, housing & handling, and retirement, to understand how well informed and accurate their perceptions are.

A 2021 investigation of Australian public perceptions of assistance dogs and companion dogs revealed that both populations received high ratings in terms of their usefulness and their happiness (Gibson & Oliva, 2021). This is in line with findings reported by Cobb et al. (2020) in a global population. However, assistance dogs were perceived as significantly happier and better used than companion dogs (Gibson & Oliva, 2021). This contrasts with Taylor and Signal's (2009) 'Pest, Pet, Profit' theory which states that pet animals are most likely to be perceived as having the highest welfare, followed by those used for utility purposes (such as assistance dogs), and with 'pest' animals rated the lowest. This may be explained by important differences which emerged from qualitative data. For example, participants endorsed the idea that, for both cohorts, a dogs' happiness was contingent upon them '*being loved and well treated'*, however, this was only endorsed by 50% of participants for assistance dogs, but 83% for companion dogs. This may reflect a belief that the care of companion dogs is more variable than the care delivered to assistance dogs (and therefore a more important consideration for this cohort). This has been previously supported by the idea that the high 'profit' value of assistance dogs leads to them receiving greater veterinary care and more regular check-ups (Branson et al., 2010). There was also concern for companion dogs being left alone or neglected during the day, with 'sufficient time with owners' and 'physical and mental stimulation' the next two most commonly endorsed themes for their conditional happiness.

The aim of this study was to investigate attitudes towards companion dogs in contrast to DDDs in an Australian sample, using a mixed methods approach. As per Gibson and Oliva

(2021) we sought to compare public interest between the two dog populations, support for their use, as well as how people perceived the dogs' happiness. It was hypothesised that the public would have higher interest in DDDs due to their pervasiveness in the media, but be less supportive of them and perceive them to be less happy compared to companion dogs due to the negative stigma that has been associated with them and the work they do. While the use of DDDs has been questioned based on concerns about their effectiveness and potential breaches of people's civil and human rights, this is the first exploration of public perceptions regarding the use of DDDs that asks the community to consider the perspective of the dogs' affective experience (i.e. their happiness).

Methods

Ethical statement

Approval for this study was granted by the [blinded for peer review] Human Research Ethics Committee. Participants were offered the chance to enter a $A50 prize draw for their participation in the study.

Participants

Participants were recruited online using the social media platform, Facebook, and shared within personal and professional networks of the researchers. To be eligible to take part in the current study, participants had to be at least 18 years old, reside in Australia, and possess a level of English which enabled reading and responding to an online questionnaire. The sample consisted of 129 participants (14 males and 115 females). Participant ages ranged between 21 – 86 years with a mean age of 43.8 (±15.5).

Participant demographic details are presented in Table 1. Most participants self-identified as white, university educated, and with a liberal political orientation. The vast majority reported liking dogs somewhat or very much and most had experience owning one. By contrast, only a minority had ever owned or raised a working dog. Most respondents had experienced an encounter with DDDs, most commonly at the airport.

Table 1.

Participant Demographics

	Frequency (%)
Highest Education Level	
High School	11 (8.5%)
Diploma	17 (13.2%)
Bachelor's Degree	74 (57.4%)
Master's Degree	25 (19.4%)
Doctoral Degree	2 (1.6%)
Ethnicity	
White or Caucasian	119 (92.2%)
Asian	5 (3.9%)
Hispanic or Latino	1 (0.8%)
Other	4 (3.1%)
Political Orientation	
Strongly Conservative	1 (0.7%)
Mostly Conservative	2 (1.6%)
Somewhat Conservative	8 (6.2%)
Neutral	40 (31.0%)
Somewhat Liberal	26 (20.2%)
Mostly Liberal	36 (27.9%)
Strongly Liberal	16 (12.4%)
Like of Dogs	
Don't like dogs at all	0 (0.0%)
Dislike somewhat	1 (0.7%)
Neither like nor dislike	3 (2.3%)
Like somewhat	16 (12.4%)
Like dogs very much	109 (84.5%)
Ownership of Companion Dogs	
I currently, or have previously owned a companion dog as the primary care-giver	60 (46.5%)
I currently, or have previously owned a companion dog but not as the primary care-giver	27 (20.9%)
Both of the above	15 (11.6%)
None of the above	27 (20.9%)
Ownership of Working Dogs	
Owned an assistance dog as the person with the disability	2 (1.6%)
Owned an assistance dog but not as the person with the disability	2 (1.6%)
Owned some other type of working dog	7 (5.4%)
Cared for/raised a puppy destined to work as an assistance dog	1 (0.7%)
Cared for/raised a puppy destined to work in some other working role	5 (3.9%)
None of the above	102 (79.1%)
Come across DDDs (more than one answer could be selected)	
Yes, at the airport	95 (73.6%)

Yes, a music festival	13 (10.1%)
Yes, on public transport	5 (3.9%)
Yes, in the city	2 (1.6%)
Yes, at work	3 (2.3%)
Yes, inside a prison	2 (1.6%)
No, never	19 (14.7%)

N = 129

Materials

Detector & Companion Dog Questionnaire

This measure is a modified version of Gibson and Oliva's (2021) Assistance & Companion Dog Questionnaire, designed to meet the specific purposes of this study. This involved changing the term "assistance dog" for "drug detector dog" where appropriate, and the inclusion of additional questions aimed at determining participants' knowledge about DDD recruitment, training, housing & handling, and retirement.

The questionnaire consisted of 36 items, which included a mix of open-ended as well as fixed-choice questions. In part one, participants answered several demographic questions about themselves. In part two, participants were provided with an explanation for both types of dog roles. DDDs were defined as a type of working dog that has been purposely trained to detect various drugs on command, such as at Australia's borders (i.e. airports, mailrooms, etc.) and public places. Companion dogs were defined as pets not specifically trained or involved in work, but that provide companionship to an individual or family. To ascertain participants' knowledge about DDDs, five questions were asked about their recruitment, training, housing & handling, and retirement with multiple response options provided. Respondents were only allowed to select the option that they believed was most true and then indicate the level of confidence in their response.

To assess participants' interest in the dogs, they were then asked what media they follow in relation to the two types of dogs and were then asked to rate the following questions on a 5-point Likert-style scale: *To what extent are you interested in television programs and articles on companion dogs?* and: *To what extent are you interested in television programs and articles on DDDs?* Ratings varied from 'Never interested' to 'Always interested'. Below each question participants were asked: *If you have you seen (including on television or in articles), or interacted with, any kind of DDD/companion dog, what did you think about then? Please describe what you felt. You can describe anything. For example, about the dog, the owner, or the people around them, etc*. Next, participants were asked to indicate their attitude towards the use of dogs by expressing the extent to which they thought the following was a good or bad idea on a 7-point Likert-style scale from 'Very bad' to 'Very good': Below each question they were asked: *What do you think about using dogs for work as drug detection sniffer dogs?*, and *What do you think about keeping dogs as companion (i.e. pet) animals?*. Similarly, participants were asked to rate the happiness of the two cohorts of dogs on a 7-point Likert-style scale from 'Very unhappy' to 'Very happy', and then asked: *What factors may influence their happiness?* Finally, participants were asked to indicate whether both types of dogs should or should not have access to the following public places: public transport, public festivals, bars/pubs/clubs, airports, and schools. For a full copy of the questionnaire, refer to the appendix.

Procedure

Participants were invited to participate in the study investigating attitudes towards Drug Detection Dogs and Companion (i.e. pet) Dogs. Data collection took place between May and June, 2020 via a secure internet link accessed through a Facebook advertisement or email. Participants who clicked on the link were then directed to the online questionnaire hosted on

Qualtrics. After being presented with an explanatory statement, participants were required to opt-in to continue to the survey items. The approximate time to complete the questionnaire was 15 minutes. Consent was implied by survey completion.

Data Analysis

Mean scores comparing interest, attitude towards use, and happiness ratings for companion dogs and detector dogs were calculated and assessed using paired sample t-tests. Due to their potential to be overly influential on the model, it was decided that cases with z-score differences of ≥3.29 from the mean would be removed before the t-test was run. This resulted in the removal of two cases for the happiness variable, in which two participants had rated companion dog happiness extremely high and detector dog happiness extremely low. Visual inspection of histograms, and P-P plots of the difference score data revealed that it was normally distributed for all variables.

Qualitative free-hand responses were analysed using thematic content analysis, starting with a deductive method using pre-determined themes observed by Gibson and Oliva (2021), while allowing new themes to emerge inductively as relevant to the detector dog population. This was achieved by two research team members independently rating the responses to each question in blocks of 10, and then comparing their coding and resolving any discrepancies through discussion. This process of independent coding followed by comparing and consultation continued until ≥80% inter-rater reliability was reached for each question. Once achieved, the first team member completed the coding and the second team member reviewed it. Frequencies were calculated as the number of participants who endorsed a theme, with participants able to endorse more than one theme within their response. The sample size for each question included both those participants who provided responses relating to main themes, as well as responses that did not relate to these themes. Only participants who did not

provide a response, or who provided a response that did not adequately address the question, were excluded.

Results and Discussion

Participant responses were downloaded directly from Qualtrics and imported into SPSS for data cleaning and analysis (Version 26; IBM, 2019). There were no missing values on any variables apart from some opportunities for freehand responses to questions which were left blank. Qualitative analysis relating to companion dogs revealed almost identical themes to Gibson and Oliva (2021) and so we refer the reader to this paper for discussion on themes relating to companion dogs. This paper will present data relating to perceptions of DDDs, comparing them with perceptions relating to another working dog (assistance dogs) from Gibson and Oliva where relevant. The exact theme endorsement for companion dogs in the current study are available in the supplementary materials.

Detector Dog Access to Public Places

To ascertain the support for the use of dogs in different contexts, participants endorsed one of the following options relating to DDDs access to a range of public locations: 'should' 'shouldn't' or 'unsure', with responses summarised in Table 2. There was high endorsement for the use of DDDs in all locations, with only a minority of participants selecting the 'shouldn't' or 'unsure' options.

Table 2.

Participant endorsement of DDDs in public places

	Should (%)	Shouldn't (%)	Unsure (%)
Public Transport	106 (82.2%)	12 (9.3%)	11 (8.5%)

Public Festivals	108 (83.7%)	13 (10.1%)	8 (6.2%)
Bars/Pubs/Nightclubs	99 (76.7%)	20 (15.5%)	10 (7.8%)
Airports	120 (93.0%)	5 (3.9%)	4 (3.1%)
Schools	97 (75.2%)	20 (15.5%)	12 (9.3%)

N = 129

Public Knowledge of Drug Detection Dogs

Participants' level of knowledge about DDDs was assessed across five questions about detector dog training, living conditions, and retirement. The frequency of their endorsement to the response options are presented in Table 3 below. The most correct response based on the authors' knowledge and understanding of key government DDD facilities in Australia are presented in bold, acknowledging that agencies may not all operate using the same practices (Branson et al., 2010).

Table 3.

Participant beliefs about DDD training, living conditions, and retirement

Which of the following do you believe to be most true about **recruitment** of detector dogs in Australia?	
Response options:	Frequency (%)
Detector dogs are purpose bred in a kennel facility, then fostered by a carer until they are ready to commence their training back at the detector dog training and kennel facility at approximately one year	104 (80.6%)
Any dog can be bred, reared and train to become a detector dog, there are no special requirements to 'raise' or 'recruit' a detector dog	18 (14.0%)
Detector dogs are recruited from pounds/shelters and then put forward for recruitment to/assessment for the role of detector dog via the Detector Dog program	7 (5.4%)
Which of the following do you believe to be true of **training commencement** for detector dogs in Australia?	
Training starts when the dogs are between 8-10 weeks old	61 (47.3%)
Training begins when the dogs are between 12-18 months old	50 (38.8%)

Training can begin at any time	13 (10.1%)
Training begins when the dogs are between 18-24 months old	5 (3.9%)
Which of the following do you believe to be true of **training location** for detector dogs in Australia?	
All training is learned at the detector dog training and kennel facility but then practiced at home, where the dogs live outside of training sessions	65 (50.4%)
All training occurs at the detector dog training and kennel facility, where the dogs live when they commence training	42 (32.6%)
All training is learned and practiced at the detector dog training and kennel facility, where the dogs live full time	18 (14.0%)
All training is learned from the home where the dogs live full time	4 (3.1%)
Which of the following to you believe to be true of **housing and handing** of detector dogs in Australia?	
Detector dogs are housed at the private home of their single handler and 'go to work' with them each day they are rostered	59 (45.7%)
Detector dogs are kennelled at a central facility and can be handled by several separate handlers, depending on rostering	32 (24.8%)
Detector dogs are kennelled at a central facility and work only with the single handler they completed their initial training with	28 (21.7%)
Detector dogs are housed at the private home of whichever handler they are working with. They may share their time across several separate handlers and homes, depending on rostering	10 (7.8%)
Which of the following do you believe to be the most common of **retirement** of Australian detector dogs?	
Detector dogs are offered up for public adoption as a companion animal when they are no longer suited to work	75 (58.1%)
Detector dogs that are no longer suited to work live as a companion animal with their handler	48 (37.2%)
Detector dogs that are no longer suited to work are euthanized	3 (2.3%)
Detector dogs that are no longer suited to work live at the training facility for the rest of their lives	3 (2.3%)

N = 129

Participant's confidence in their responding to each question is presented in Table 4 below.

Table 4.

Participant confidence in their beliefs about DDD training, living conditions, and retirement

	Self-rated response confidence <50% Not confident - >90% Very confident, Frequency (%)			
	<50%	50-69%	70-89%	>90%
Recruitment	17 (13.2%)	33 (25.6%)	57 (44.2%)	22 (17.1%)
Training commencement	31 (24.0%)	36 (27.9%)	48 (37.2%)	14 (10.9%)
Training location	30 (23.3%)	45 (34.9%)	43 (33.3%)	11 (8.5%)
Housing & handling	33 (25.6%)	48 (37.2%)	39 (30.2%)	9 (7.0%)
Retirement	32 (24.8%)	41 (31.8%)	44 (34.1%)	12 (9.3%)

N = 129

To determine whether the more confident responders were also the more correct responders, response data was recoded into 'correct' or 'not correct', and the confidence data into a binary 'confident' (70%+) or 'not confident' (<70%). Chi-square tests of independence revealed non-significant differences in confidence for correct versus incorrect responders on questions relating to recruitment, training commencement, training location, and retirement ($p > .05$). Therefore, we can conclude that those who answered correctly were no more confident in their responses than those who answered incorrectly, However, a significant difference was found for the question relating to housing and handling, X^2 (1) = 6.21, p = .013. The strength of association was small, Cramer's V = 0.22. Based on the odds ratio, the odds of being confident were 3.30 times higher if a person was incorrect than if they were correct, reflecting a Dunning-Kruger effect (Kruger & Dunning, 1999), whereby responders with limited knowledge overestimate their knowledge relative to others.

Participants were mostly correct about DDD recruitment, perhaps because there is a call for the public to be puppy carers, and so this aspect of their lives is more transparent and understood by the general community. While the majority incorrectly believed their training began at 8-10 weeks old, this confusion might be explained by the fact that this is usually when they are sent to live with a carer for socialisation and in some cases, general commands (e.g. walking on lead, sitting when asked, etc.) training, as opposed to formal training in scent detection work. Most dogs' official drug detection work training begins between 12-18 months of age, which was the next most selected response. As can be seen in Table 4, confidence ratings for responses to these questions were mixed, with the majority rating 50-89%, followed by <50% for most questions, and a minority confident at 90% or higher. This suggests there is a lack of public understanding about DDDs, especially regarding what happens to them after their recruitment and during training. While there is media exposure of DDDs when working, there is not demonstrable public awareness about their lives when not operational.

Interest in Drug Detection Dogs and Companion Dogs

The majority of participants had some interest in consuming media relating to both DDDs and companion dogs. Social media platforms Facebook and Instagram were the most popular mediums for accessing media about companion dogs, followed by television, and to a lesser extent, news media and radio/podcasts. For DDDs, the most popular medium was television, followed by social media platforms, in particular Facebook, and then to a lesser extent print media and radio/podcasts. It is of note, however, that approximately half of the participants report not accessing any media about DDDs, double the number reported for companion dogs. On the Likert scale rated from 1 (Never interested) to 5 (Always or almost always interested) the mean rating for DDDs was 2.95 (±1.10) and 3.05 (±1.06) for companion dogs,

which corresponds to an average of 'sometimes interested' for dogs in both roles (refer Table 5).

Table 5.

Frequency of participant interest in detector versus companion dogs

	Frequency
Interest in television programs and articles on Detector Dogs	
Never Interested	12
Rarely interested	29
Sometimes interested	58
Most of the time interested	14
Always or almost always interested	16
Interest in television programs and articles on Companion Dogs	
Never Interested	8
Rarely interested	29
Sometimes interested	57
Most of the time interested	19
Always or almost always interested	16

N = 129

A paired samples t-test revealed that there were no significant differences between interest in DDDs and interest in companion dogs, Mdiff = 0.11 (± 0.77), 95% CI [-.025, .25], t(126) = 1.62, p = .109. This suggests that our participants were equally interested in both cohorts of dogs, possibly due to a self-selection bias whereby only participants who like and are interested in all dogs (regardless of whether they are working dogs or companion pets) chose to participate in the study.

Thematic analysis of qualitative responses relating to people's impressions about DDDs revealed prominent themes, which are summarised in Table 6.

Table 6.

Qualitative Themes Relating to Interest in Detector Dogs

Theme	Definition	Example	Frequency (%) n = 124

Positive perceptions and sensations	Expresses positive feelings towards detector dogs themselves, experiences with detector dogs, and programs about detector dogs. Feelings include love, happiness, interest, admiration	• I felt very comfortable around the drug detection dog	41 (33%)
No interaction when working	Expresses an understanding that they cannot interact with detector dogs when they are working, even though they may have the desire to do so	• I always wanted to pat them but I am not allowed	18 (15%)
Dog focussed and obedient	Expresses a belief that detector dogs are focused and obedient and respond to procedural tasks and discipline	• I saw a sniffer dog at the airport and he seemed focused and obedient. The atmosphere seemed procedural	18 (15%)
Distinct feelings of nervousness	States that they felt nervous or intimidated around detector dogs	• It can make me feel nervous even when there is no reason to be nervous. I am more nervous towards the people than the dog	16 (13%)
Dogs enjoy working	Expresses a belief that the detector dogs enjoy their working role	• I have thought *'look at that dog having the time of its life doing its job*'	16 (13%)
Approval/ Community benefit	Expresses a belief that detector dogs play an important role in society that benefits the community	• Working dogs are integral to drug detection	13 (10%)
Admiration for trainers and training	Expresses an admiration for the trainers and training of detector dogs	• They are very professional and have clear boundaries whilst working	12 (10%)
Other negative perceptions and sensations	Expresses negative feelings towards detector dogs themselves, experiences with detector dogs/handlers, and programs about detector dogs	• The handlers are always unfriendly and strict about not touching or interacting with the dog. The dogs are in a more tense and serious environment, and don't necessarily appear to be "happy"	9 (7%)
Close relationship between owner/handler and the dog	Belief in close bond between the handler and their detector dogs	• *Border Security* and *The Force.* The dogs and handlers have a good bond	8 (6%)

Frequencies were calculated by summing the number of participants who endorsed a theme. Individual participants were only able to endorse a theme once but could endorse more than one theme within their response.

When comparing findings relating to DDDs to that of assistance dogs in Gibson & Oliva's (2021) study, there are some noteworthy differences. First, the same top two themes were most commonly endorsed for dogs in both working roles – '*Positive perceptions and sensations*' and '*No interaction while working*'. However, an important difference is that participants in Gibson and Oliva's study (2021) often expressed frustration at others seen interacting with an assistance dog, which was not observed in the current study on DDDs.

The DDD-related themes: '*Dog focussed and obedient*', '*Distinct feelings of nervousness*', and '*Other negative perceptions and sensations*' were also not endorsed by participants in Gibson and Oliva in relation to assistance dogs, and may reflect the general public's hesitancy to interact with DDDs, or, the knowledge that they shouldn't, or that they won't be able to get away with it because the dogs are generally handled by government officers in public places. The fact that participants felt nervous around DDDs is also different to assistance dogs, where some participants endorsed the idea that "*they make disabled people more approachable*" (Gibson & Oliva, 2021).

Other differences can also be identified, for example, '*Dogs enjoy working*' did not reach the 5% endorsement cut-off with assistance dogs, which might suggest that the public believe the DDD work is more fun for dogs than assistance work. Similarities can also be seen, for example, '*Approval/community benefit*' is like the theme '*Practical benefits*', endorsed for assistance dogs, alluding to the societal benefit that the work of dogs brings to communities. Additionally, '*Admiration for trainers and training*' and '*Close relationship between owner/handler and dog*' received similar endorsements to those observed in relation to assistance dogs.

Use of Drug Detection and Companion Dogs

Most participants endorsed support for people's use of both DDDs and companion dogs, however there was a wider range of responses for DDDs, suggesting support for the use of DDDs varies more in the community than the use of dogs as companions. Endorsement was rated on a Likert scale from 1 (Very bad) to 7 (Very good) with the mean support for the use of detector dogs at 6.02 (±1.36), corresponding to an average of Moderately good, and for

355 companion dogs at 6.61 (±0.78), corresponding to an average between Moderately good and
356 Very good (refer Table 7).
357
358 **Table 7.**
359 *Frequency of participant support for the use of detector versus companion dogs*

	Frequency
Use of dogs for drug detection.	
Degree to which you think it is a good or bad idea.	
Very bad	1
Moderately bad	3
Slightly bad	2
Neither good nor bad	13
Slightly good	21
Moderately good	17
Very good	72
Use of dogs as companion animals.	
Degree to which you think it is a good or bad idea.	
Very bad	0
Moderately bad	0
Slightly bad	0
Neither good nor bad	4
Slightly good	12
Moderately good	14
Very good	99

360 *N* = 129
361
362 A paired samples t-test revealed that participants were significantly more supportive of
363 people using dogs for companion purposes than for drug detection, Mdiff = 0.58 (± 1.32),
364 95% CI [0.34, 0.81], t(126) = 4.89, $p < .001$, with a small – medium effect, $d = 0.44$.
365
366 Thematic analysis was conducted for qualitative responses offered as to why people think
367 using dogs to detect drugs is a good or bad idea. Table 8 summarises the themes that
368 emerged.
369
370 **Table 8.**
371 *Qualitative Themes Relating to support for the Use of Detector Dogs*

Theme	Definition	Example	Frequency (%) n = 123
Dogs are capable	Expresses that detector dogs have specific traits that make them capable of doing specific tasks relevant to drug detection	• Dogs anatomy makes them highly suitable for this role in society	64 (52%)

Approval/ Community benefit	Expresses a belief that detector dogs play an important role in human society that benefits the community	• They serve a purpose that is useful and contributes to the safety and wellbeing of society	34 (28%)
Dogs should be loved and well treated	States that detector dogs should be appreciated and well taken care of by their handlers. Encompasses ability to provide proper care including appropriate training, environment, and adequate time.	• Just hope their wellbeing is being considered	26 (21%)
Dogs enjoy working	Expresses a belief that the detector dogs enjoy their working role	• I think the dogs are very happy to spend that time sniffing and helping	25 (20%)
Dogs not benefiting	Expresses concerns about the use of detector dogs e.g. the potential stress or restrictiveness of the lived experience of a working dog	• But I do also worry about the animals' quality of life. If they did have poor quality of life, is it right for human beings to force these animals into such a life?	10 (8%)

Frequencies were calculated by summing the number of participants who endorsed a theme. Individual participants were only able to endorse a theme once but could endorse more than one theme within their response.

The higher support for the use companion dogs compared to DDDs demonstrates beliefs that are in direct contrast to those about assistance dogs; participants showed more support for assistance dogs when compared to companion dogs (Gibson & Oliva, 2021). This might be explained by the 'negative perceptions' and 'nervousness' reported in Table 6. There was also 8% endorsement for DDDs not benefitting from their working role, like that observed for assistance dogs in Gibson and Oliva (7%). This theme related to concerns for animal welfare and lack of important freedoms relating to this (Mellor et al., 2020). '*Dogs are capable*' was the highest endorsed theme at 52%, which was only endorsed at 14% for assistance dogs (Gibson & Oliva). The definition of this theme was also slightly different for assistance dogs compared with DDDs. DDDs have more innate skills for detection (i.e. their anatomy/nose) and this work cannot be easily replicated by people or machines, whereas assistance dogs are capable of being trained to perform tasks that could also be undertaken by people or adaptive technology in the same environment as someone with a disability. This could indicate that people perceive dogs as being uniquely suited to serving in a community drug detection role which has perceived social value that is separate to other working dog contexts. Not

391 endorsing the use of DDDs could conflict with people's beliefs about regulating drugs in
392 society if they believe DDDs to be the only, or the most effective way, to reduce the use and
393 distribution of drugs in Australia.
394
395 The next highest endorsed theme was '*Approval/Community benefit*', which is aligned with
396 the assistance dog theme of '*Owner practical benefits*' which was also highly endorsed at
397 57% for assistance dogs (Gibson & Oliva, 2021). These two themes associate the perceived
398 social value and benefits to humans as a direct result of the work the dogs perform. Hence,
399 approval for the role of working dogs is endorsed when there is an observable benefit to
400 human society. The idea that '*Dogs should be loved and well treated*' was endorsed at 21%
401 for DDDs, which is slightly higher than that observed for assistance dogs. This result might
402 be explained by the lack of confidence about how DDDs live and are treated when not
403 working, and the ordering of the questions testing their knowledge which appeared
404 beforehand. It might also be explained by a slight difference in the definition of this theme
405 compared with assistance dogs, with "may also state it depends on the owner" missing for
406 DDDs. This is likely because participants believe that DDD care is more standardised than
407 assistance dog care, even if they don't know what this standard condition is.
408
409 As in responses relating to participants' interest in dogs, the theme '*Dogs enjoy working*' was
410 slightly higher for DDDs in participant responses reflecting their use, compared with results
411 in Gibson and Oliva (2021) relating to assistance dogs. This adds further support for public
412 belief that dogs enjoy drug detection work more than assistance dog work. This may be due
413 to positive media coverage, e.g., television shows such as *Border Security,* and *Customs*
414 which often show the dogs engaging in play rewards with their handler after an indication or
415 successful find. This was further emphasised by participants in their open-ended item

responses, e.g., "*Certainly the public perception via the media show them as happy and enjoying the work they do*". There is evidence to support that allowing companion dogs to engage in nosework (sniffing things) makes them more "optimistic" on a cognitive bias task, indicating that sniffing is good for their welfare (Duranton & Horowitz, 2019), but there is no comparable study to date for DDDs. The themes '*Mutually beneficial relationship*' and '*Owners emotional benefit*' observed in relation to assistance dogs (Gibson and Oliva, 2021) were not endorsed in relation to DDDs, which might be explained by the fact people see these dogs' work as offering a community benefit rather than a direct benefit to their owner.

Happiness of Drug Detection/Companion Dogs

An animal's mental experience is one of the five domains commonly used in the assessment of animal welfare (Mellor et al., 2020). This reflects the positive and negative lived experiences resulting from the other four domains: nutrition, environment, physical health, and agency through behavioural interactions (with the environment, people, and other animals). While there was spread of scores across both cohorts, most participants perceived the happiness of both drug detection and companion roles to be high. From a possible range of 1 (Very unhappy) to 7 (Extremely happy) the mean perceived happiness rating for DDDs was 6.00 (±1.32), corresponding to Moderately happy, and 6.23 (±1.12) for companion dogs, corresponding to between Moderately and Extremely happy for companion dogs. All frequencies are presented in Table 9.

Table 9.

Frequency of participant happiness ratings for detector versus companion dogs

	Frequency
Perceived happiness of Detector Dogs	
Very unhappy	1
Moderately unhappy	3
Slightly unhappy	4
Neither happy nor unhappy	10
Slightly happy	12
Moderately happy	38
Extremely happy	61

Perceived happiness of Companion Dogs	
Very unhappy	1
Moderately unhappy	1
Slightly unhappy	2
Neither happy nor unhappy	8
Slightly happy	8
Moderately happy	40
Extremely happy	69

N = 129

A paired samples t-test revealed that there were no significant differences between the perceived happiness ratings of DDDs and companion dogs, Mdiff = 0.15 (± 1.21), 95% CI [-0.063, 0.36], t(126) = 1.40, p = .17.

Thematic analysis on participants' responses to reasons behind participants' perception of the DDDs' happiness revealed several themes, summarised in Table 10.

Table 10.

Qualitative Themes Relating to the perceived Happiness of Detector Dogs

Theme	Definition	Example	Frequency (%) n = 124
Being loved and well treated	States that detector dog happiness is dependent on being appreciated and well taken care of by their handlers.	• Being treated well by the drug detection team.	34 (27%)
Having a good relationship with handler	Indicates a close and meaningful bond between detector dog handler is important for their happiness.	• The joy of working with someone so closely and having that bond	34 (27%)
Must enjoy working	Endorses that detector dog' happiness is dependant on enjoying the work they do. States that working should make them happy	• They are proud of themselves when doing their job well. They want to be useful	26 (21%)
Their life when not working	Expresses that detector dogs' happiness depends on their life when they are not working, including their living arrangements	• What happens during their non-working time. If they get to go home with someone and have company then they're all set. If they are locked up in a cage then that would completely mess with their happiness	18 (15%)
Having a potentially stressful/restrictive training/working life	Reflects that the strict training or working life may be potentially stressful to the dog, and therefore impacts their happiness	• Highly trained working a lot of hours, in high stress environments	16 (13%)
Companionship	Expresses that detector dog's happiness depends on their level of companionship	• Companionship	11 (9%)

Frequencies were calculated by summing the number of participants who endorsed a theme. Individual participants were only able to endorse a theme once but could endorse more than one theme within their response.

As can be seen in Table 10 '*Being loved and well treated*' and '*Having a good relationship with handler*' were the top two endorsed themes at 27% each. While they are likely to interrelate, as handlers are responsible for their care, '*Being loved and well treated*' related more to the environment where they are housed, the way they are trained and rewarded for their work, and their general handling, (relevant to the 'nutrition', 'environment', and 'behavioural interactions and agency' domains in the Five Domains Model of animal welfare, Mellor et al., (2020)), consistent with findings of Cobb, et al.'s study of attitudes relating to the welfare of dogs housed in kennel facilities (2022). '*Having a good relationship with handler*' was more aligned with the perceived bond between dogs and their handler. Endorsements for this theme generally spoke of a unique handler-dog bond reflecting that many participants believed that the industry model involves one handler for one dog, leading to a close working relationship resulting in a meaningful bond for the dog. Attachment to people is important to working dogs and an area deserving more research attention to understand its importance, especially through major transitions of social attachment and environment (e.g. puppy raising to training) to working success and dog welfare (Cobb, et al., 2021). Indeed, almost half of participants believed that "detector dogs are housed at the private home of their single handler and 'go to work' with them each day they are rostered" (refer to Table 3), albeit with varying certainty (refer to Table 4). However, an important association was found between high confidence in response to this question and answering incorrectly. This reveals a Dunning-Kruger effect (Kruger & Dunning, 1999), whereby responders with limited knowledge about how DDDs are housed and handled overestimate their knowledge about this relative to others. Therefore, great caution should be applied to these perceptions, which are largely based on uninformed beliefs made with high confidence,

with the majority believing that DDDs live at home with their handler when they are not at work. While this may reflect historical practices, present day Government working dogs such as DDDs are routinely housed individually in kennels whilst in training and during their working lives, with controlled access to indoor and outdoor environments (Branson, et al., 2010). This decision can relate to economical and human-focused management decisions (e.g., greater operational flexibility for working dogs when handlers are sick or on leave, agencies avoiding paying for handlers to securely house and manage dogs in their private homes, etc.) (Cobb, et al., 2022). While this environment may result in animals that are eager to work because leaving the kennel facility alleviates potential boredom or isolation, it may not be in the dogs' best interests from a welfare perspective.

The definition for dogs '*being loved and well treated*' also differed to Gibson and Oliva's (2021) definition in relation to assistance dogs, where participants' open-ended responses revealed concern that assistance dog owners may not be able to properly care for their dog and an expectation that detection dog handlers would. There was higher (almost double) endorsement for '*must enjoy working*' for assistance dogs but also an endorsement of a new theme '*their life when not working*' at 15% demonstrating that i) many people are unaware of DDDs lives when not working and ii) there is a level of concern about DDDs lives when not working, perhaps because they were previously questioned about it, and iii) participants believe that DDDs' happiness depends not only on enjoying their work but enjoying their lives outside of work as well.

There seems to be confusion about the lives of DDDs, with many people assuming that DDDs live a 'normal' life outside of work and have the opportunity to bond with one handler, who is also their primary attachment figure (akin to an owner) outside of work. However, the

tendency for incorrect responders to be more confident, is concerning for participants who believe that both a working dog's operational work life and its life outside of work are contingent factors for working dog happiness. Given this, we believe there should be greater clarity and transparency around all aspects of DDD management and assurance of positive working dog welfare, if the DDD industry wants to maintain its social license to operate (Hampton et al., 2020). Standards Australia have released a new standard for '*Privately contracted security and detection dogs'* (Parts 1 & 2, AS 5350.1:2022; Standards Australia, 2022) which covers requirements for acquisition, welfare, training, deployment, and retirement as well as training and certification of the dogs and their handlers. This is the first publicly available standard of its kind and will enable third party auditing and differentiation in the private sector of companies who meet the standard. This provides a level of transparency to the community about how working dogs are cared for and welfare assurance that aligns with modern expectations.

There was less endorsement for '*having a potentially stressful/restrictive training/working life*' for DDDs at 13%, compared to assistance dogs at 34% (Gibson & Oliva, 2021). Perhaps this is due to the belief that DDDs work shifts and don't need to be "on duty" at all times, as assistance dogs may be perceived. As was found by Gibson and Oliva in relation to assistance dogs, some participants held beliefs about DDDs having pride and satisfaction in their work (e.g. "*They are proud of themselves when doing their job well. They want to be useful.*" and "*Dogs love to have a purpose*"). As previously highlighted by Gibson and Oliva there is no scientific evidence that dogs have the capacity to experience secondary emotions such as pride or the socio-cognitive capacity to feel purpose (refer to Gibson and Oliva for a more in-depth discussion on this). As such, this may reflect anthropomorphic tendencies of participants to attribute their own "human" thoughts and feelings onto the dogs (Horowitz

and Bekoff, 2015). Further, the belief that DDDs feel pride from doing a good job, may also influence beliefs about how DDDs form such strong bonds with their handlers (e.g. as a result of being praised for said work). Finally, there was 9% endorsement of companionship. In most cases it was not clear whether the participant was referring to human companionship or companionship with other dogs but might be aligned to Gibson and Oliva's assistance dog theme of '*having constant companionship with owner*' and may have been prompted by the questions asked about their living conditions and/or a belief that they have more companionship because they work.

Strengths, Limitations, and Future Directions

The main strength of our study is that is it the first study on DDDs, to the best of our knowledge, which considers not only the public's perception, but also the public's knowledge about DDDs and the associated industry. It is also the first study that we know of to consider the perspective of the dog's affective experience i.e., the dog's happiness, one of the Five Domains relevant to animal welfare (Mellor et al., 2020). Our findings can also be considered as more generalizable to the general Australian public as compared to other studies that have targeted specific populations e.g., music festival attendees who might be biased. This may explain the relatively strong support for DDDs to have access to public places, including public transport, festivals, pubs, schools, and airports, with the majority of our sample expressing the importance of drug preventive measures. Having said that, it is important to recognise the potential for biases in this study's sample. For example, our sample was comprised mostly of female participants who indicated they liked dogs very much and had previous experience of owning a dog (refer to Table 1). These factors have been previous reported to impact perceptions and attitudes towards dogs (Marinelli et al., 2007). Our sample also held mostly liberal political views, which, along with the female gender, has been

associated with holding less speciest attitudes, and therefore may be less agreeable to using animals in working roles that serve humans than their more conservative counterparts (Caviola, Everett, & Faber, 2019). In addition, knowledge about protocols regarding DDDs' training, housing, handling, and retirement were shown to vary and might not reflect current practices. As such, the participants to this survey may have biased attitudes in accordance with what they believe to be true, which may not be in accordance with the facts. Future studies should aim to replicate this work in relation to DDDs as well as other workings dogs (e.g. police patrol dogs that help apprehend people, livestock herding (farm) dogs, racing greyhounds, etc.). Researchers aiming to replicate or extend this study should be careful to provide a clear definition for what is meant by 'training' to avoid confusion between socialisation and formal scent detection training. Future studies in canine science should also aim to extend our understanding of what is optimal for working dog welfare in terms of handler attachment, housing arrangements, etc.

Conclusion

This study provides important insights about the Australian public's perceptions about DDD. For example, despite an equal level of interest in companion dogs versus DDDs our findings suggest limited knowledge about the lives of DDDs "off the job", especially in relation to their housing and handling arrangements. While the current findings were generally in support of the use of dogs for drug detection purposes, support was significantly lower when compared to keeping dogs for companion purposes. Qualitative insights suggest that most participants believed the dogs are capable of working in drug detection, and are generally supportive of it, however almost half incorrectly believed that the dogs work only with one handler and people believe this relationship is important for their happiness. Being loved and well treated was also believed to be contingent on their happiness; a level of welfare concern

576 exists regarding the lives of these dogs when not working, as well as the work being
577 potentially stressful or restrictive. Greater transparency surrounding the lives of DDDs both
578 “on” and “off the job” will ensure the DDD industry maintains community support and their
579 social license to operate.

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