Influence of the competition context on arousal in agility dogs

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Abstract

To determine whether participation in dog agility has an impact on canine arousal and welfare, this study aimed firstly to identify the effect of the competition context on arousal changes experienced by dogs, as distinct from purely the physical participation in agility, and secondly to assess the handlers’ ability to recognize this. The behavior of twenty dogs was recorded immediately before completion of both a competition and a training run, whilst the accuracy of handlers’ observations of their dogs’ behavior pre-run was examined via questionnaire. Behaviors observed included changes in body posture, tail movement, ear position, gaze direction, appeasement and displacement behaviors. Whilst a moderate number of these behaviors presented with greater frequency or duration in competition, the total number of different arousal behaviors performed was higher for dogs in competition ($p < 0.01$) compared to training. Context had a relatively modest effect on the level of arousal of agility dogs, with a greater number of behaviors indicating increased arousal in competition. Such increased arousal may adversely influence the success of dog-handler partnerships in competition. In both contexts, handlers observed fewer behaviors than their dogs performed and this important finding may have implications for dog welfare.

Keywords: agility, arousal, dog, behavior, welfare
Introduction

Dog agility is an increasingly popular activity in which the human ‘handler’ guides their dog (canis familiaris) as it runs around a course of obstacles as quickly and accurately as possible (The Kennel Club, n.d.). There are many potential benefits to dogs participating in agility. As well as engagement in physical and mental exercise, dogs who participate in structured training using positive reinforcement for activities such as agility are shown to have increased attentiveness and work more co-operatively with handlers (Deldalle & Gaunet, 2014; Marshall-Pescini, Passalacqua, Barnard, Valsecchi & Prato-Previde, 2009). Dogs who have been taught a greater behavioural repertoire may also be considered more empowered with increased resilience to phenomena such as frustration or fearfulness (O’Heare, 2011) and dogs who participate in agility may exhibit fewer unwanted behaviours, such as contextually-inappropriate aggression (Zilocchi, Tagliavini, Cianni & Gazzano, 2016).

Although there is acceptance of an increased risk of physical injury to dogs involved in these activities (Pfau, de Rivaz, Brighton & Weller, 2011; Birch & Lesniak, 2013; Birch, Boyd, Doyle & Pullen, 2015; Cullen et al, 2017), there has been only limited research into the potential negative psychological impact of competitive agility on canine welfare. Pastore et al, (2011) reported increased levels of stress-dependent behavior and elevated salivary cortisol in dogs during and after agility competition and concluded that there was an increase in emotional arousal whilst at the event. While exercise has been shown to stimulate cortisol secretion in humans and horses (Hill et al, 2008; Robson, Alston & Myburgh, 2003), this has not been found in dogs, either in endurance events (Arokoski, 1993) or in short term exercise such as agility (Rovira, Munoz & Benito, 2007). This suggests that increases in cortisol secretion must be attributed to other causes than simply the physical exertion of participating in the agility competition. However, Pastore et al (2011) were unable to discriminate whether
this increase in arousal represented a positive state of excitement (‘eustress’), or a more negative experience of distress using salivatory cortisol.

It is also argued that there is an optimal level of arousal for successful performance of a task (e.g. Sandi and Pinelo-Nava, 2007; Mendl, 1999), since an increase in arousal can enhance learning, memory and performance (e.g. Schwarze, Bingel & Sommer, 2012; Nielson & Arentsen, 2012), for example as seen in equine performance (Valenchon et al, 2013; Hada, Onaka, Takahashi, Hiraga & Yagi, 2003). Arousal above the optimal can have a detrimental effect on performance in both human (Baumeister & Showers, 1986; Hill, Hanton, Matthews & Fleming, 2010) and equine sport (McBride & Mills, 2012; Bartolomé & Cockram, 2016). Dogs at agility competitions are subject to numerous potentially arousing stimuli, including interactions with other dogs or people, various visual, auditory and olfactory stimuli, and the movement of other competing dogs (Sellers, 2016). We might therefore speculate that heightened arousal may negatively impact the performance of the dog in competition compared to that in training. Additionally, the cumulative effect of consistent or prolonged exposure to acute stressors, regardless of whether the dog experiences a positive or negative emotional response, can lead to states of biological distress (Moberg, 2000) and it is this which has welfare implications for dogs that compete regularly in agility. To date there has been no research that isolates the effect of contextual stimuli at a competitive event, as distinct from physical participation in agility, as a factor influencing the level of arousal in competing agility dogs.

Furthermore, if agility competitions are potentially stressful for the dog, it is critical for their welfare that their handlers are effectively able to gauge the level of stress involved by observing changes in the behavior of their animal. Evidence suggests that humans do not easily judge either positive or negative emotional states in dogs (Dalla Costa, Guagliumi, Cannas, Minero and Palestrini, 2014; Wan, Bolger and Champagne, 2012), and in particular,
may not be aware of the more subtle behaviors associated with early stages of stress (Mariti et al, 2012). Since agility handlers would, by definition, be considered to be experienced with dogs, it might be expected that they would be better at observing and responding to emotional changes in their dog. However, it has also been shown that experience is not necessarily a precursor to better skills in assigning emotions to dogs based on observation (Tami & Gallagher, 2009).

The aims of this study were to assess the behavioral signs of arousal exhibited by dogs shortly before participating in an agility competition compared to that in a training context, to examine the accuracy of the handlers in observing the level of arousal in their dogs in each context and the influence of handler mood on this accuracy. It was predicted that in the competition context dogs would perform a greater number of arousal behaviors, with greater frequency and longer duration, than during training and that handlers would be less accurate at observing their dog’s behavior in competition.

**Materials and Methods**

The ethical considerations of this study were approved by the Animal Welfare & Ethical Review Body (Ref 13291/2016) and Human ethics panel (ID 489) at Newcastle University. All handlers and their dogs volunteered to participate in this study following completion of a consent form detailing the aims and methods of this project. All dogs were monitored for signs of distress by the principal investigator (AC) and were withdrawn from the study if it was considered that the dog was becoming distressed.

**Subjects**

Dogs and their handlers were recruited from dog agility clubs in Northern England via the Facebook groups ‘Agilitynet’, ‘Hare & Hounds Agility Shows’ and ‘Barrow in Furness Dog
Agility Club’. Participation in the study was open to any dog/handler pair that was entered in the ‘Doc’s Dogs’ Open Agility Show, held in May 2017 at Raygill Farm, Barnard Castle, County Durham, UK under Kennel Club (KC) rules and regulations and licensed by the Kennel Club.

A total of 20 dogs participated in the study and were allocated to groups for data analysis based on breed, sex, amount of agility experience of the dog, homing history (i.e. whether the dog had been owned by the handler since puppyhood or rehomed to them as an older dog, such as via an animal rescue organisation or shelter) and size according to KC classification i.e. small (measuring 350mm or less at the withers), medium (over 350mm and less than 430mm at the withers) and large (430mm or over at the withers) (see Table 1). All dogs were over 18 months of age. All handlers were female and owned the dog with which they took part in the study.

\[\text{INSERT TABLE 1 HERE}\]

**Test environments and protocol**

Dogs were studied in two different contexts, namely a ‘competition’ context in which the dog was studied immediately prior to participating in a competitive agility run at a KC-approved show, and a ‘training’ context in which the dog was observed immediately prior to a non-competitive practice run, when no other dog/handler pairs were present. In both contexts, dogs were studied in the period of 5 minutes immediately before beginning the agility run. The order of being observed in a particular context was randomized, with 11 dogs being observed first before a training run and nine observed first before a competition run. Training and competition runs were not held on the same day. For competition, dogs were observed before their first competitive run that day, whilst for training no dog had participated in another agility activity that day.
Competition context

Competition runs took place at the ‘Docs Dogs’ Open Agility Show, held at Raygill Equestrian Centre, Barnard Castle, England during May 2017. The show consisted of 8 competition days (20-23rd May & 26th-29th May) with two rest days in between these dates. The running order for each class within the event for each dog/handler pair was randomly generated in advance of the event by the organizers and communicated to handlers approximately 10 days beforehand. The agility show consisted of four ‘rings’, each comprising a cordoned off area of grass, minimum 32m², in which the obstacle course was laid out. Classes of different abilities ran concurrently in adjacent rings throughout each day of competition and an independent judge was located inside each ring who moved around the course discretely observing the dog during the run. The obstacles inside the ring were organized in a course sequence pre-determined by the judge, with a level of complexity designed to suit the particular class. Before each class began, handlers had the opportunity to walk around the course in order to learn the sequence of obstacles and plan how to guide their dog around the course. Dogs were kept on lead until their turn to compete, when the handlers were instructed to begin by the scribe who sat at the ringside in a small shelter and noted down the judge’s scoring signals. Other ‘ring party’ personnel were present at the ring-side included people who assisted with roles such as replacing any poles which were knocked down during a run and collecting entry tickets from handlers.

Additional features present during competition days included tannoy announcements at random intervals throughout the day, food and pet supply vendors approximately 50 metres from the ringside, electricity generators servicing these vendors, other dogs and handlers running in adjacent rings, and other dogs and people walking or standing near the ringside.
Weather during data collection comprised sunshine for three days, overcast for two days and one day of light rain. Highest daytime temperatures ranged between 14°C & 19°C, which were not considered extreme in terms of dog comfort.

Training context
Training sessions took place at two venues during May 2017. Nine dogs were observed at the same venue as that of the competition, namely Raygill Farm, Barnard Castle, but on a different day to that when their competition run was recorded, to ensure the behavioral state of the dogs was neither influenced by having already participated in agility nor by anticipating participation in agility later that day. The remaining 11 dogs were observed one week before competition at Strawberry Ground Rugby Field in Barrow-in-Furness, Cumbria, UK, owned by Furness Rugby Union football club and hired under an agreement with Barrow-in-Furness Dog Agility Club. A course deemed suitable for all the participants was provided by an independent judge and laid out in advance by the principal investigator. The same course was used at both training venues, and all handlers had the opportunity to walk around the course before guiding their dog around it. There was no judge, scribe or other ring party present except for the investigator, and there were no other dogs or people within sight. Similarly, there were no food vendors or pet supply stalls open, and no electricity generators operating nor tannoy announcements during training runs. To avoid encountering other dogs or people, each dog/handler pair was given a time slot in which to complete their training run. The weather during each training session was bright sunshine, with temperatures between 15°C and 19°C.

Data collection
Behavioral observation

All behavioral observations were recorded by the same observer (AC) using a handheld, battery operated video camera (Sony HDR-CX240E). In both contexts, the behavior of each dog was recorded for the 5-minute period whilst waiting to undertake a run, to allow for habituation to the presence of the researcher and camera (Hetts, Clark, Calpin, Arnold & Mateo, 1992; Lefebvre, Giffroy & Diederich, 2010). Video sequences of 90 seconds in length of the dog immediately before it jumped the first hurdle were subsequently analysed using BORIS (Behavioral Observation Research Interactive Software, Friard & Gamba, 2016) and coded using a descriptive ethogram. The ethogram was adapted from Haverbeke, Laporte, Depiereux, Giffroy & Diederich, (2008) & Pastore et al (2011) and contained 25 behavioral and postural signs of arousal, consisting of 18 behavioral states and seven event behaviors (see Table 2).

INSERT TABLE 2 HERE

The frequency and total duration (in seconds) of behavioral events and the frequency of behavioral states performed by each individual dog within each 90-second clip was recorded. Behaviors cued or prompted by the handler were not recorded, as these behaviors did not represent a natural response to stimuli in the environment.

Arousal score

An overall arousal score, an adaptation of the ‘Relative reactivity score’ used by Huber, Barber, Faragó, Müller & Huber (2017), was calculated for each dog in each context. To generate the arousal score, a dog was scored one if a behavior from the ethogram was displayed, regardless of duration or frequency, and zero if the behavior was not displayed. Therefore, the maximum possible score was 25.
**Handler observations of their dog**

For both training and competition contexts, at the end of their dog’s run, handlers were asked to identify from a questionnaire provided any behaviors that they had observed their dog perform prior to the run. The questionnaire listed 15 behaviors, representing a subset of the behaviors scored by the investigator (see Table 2). This subset consisted of the behaviors that would be more easily observed by handlers regardless of their level of knowledge and experience, and/or where differences were more distinct, such as either upright or tucked tail. More subtle behaviors such as lip-licking were omitted from the handler observation questionnaire.

A handler accuracy score, representing the proportion of accurately observed behaviors for each dog in each context, was subsequently calculated by subtracting the number of behaviors noted by the handler on the selected handler ethogram from the number observed by the investigator during video analysis, and expressed as a proportion of correct behaviors (percentage). A handler accuracy score of zero indicates no difference between the number of arousal behaviors observed by the handler in their dog and those observed by the investigator. Therefore, the greater the score, the more discrepancy between observations by the handler and the investigator.

**Handler mood score**

Handlers were also asked to generate a subjective mood score by rating their own emotional state before their run in each context using a visual analogue scale (200mm in length), a simplified version of the ‘Visual Analogue Mood Scale’ used by Norris (1971). The mood score was determined as the point on the scale at which handlers marked based on how they ‘felt’ from completely relaxed (a mark at 0 mm) to extremely nervous (a mark at 200 mm).
**Statistical analysis**
All statistical analyses were performed using IBM SPSS V.22 (2013). The Shapiro-Wilk test was used to test data for normal distribution, and an alpha level of 0.05 was used for all statistical tests. To meet assumptions of normality for tests of analysis of variance (ANOVA), non-normally distributed data were transformed using $\log_{10}$ transformation.

**Behavior: analysis of individual behaviors**
The mean duration and/or frequency of behaviors were compared using a paired student t-test or a Wilcoxon signed rank test, as appropriate between the two contexts.

**Behavior: arousal scores**
As the arousal scores were normally distributed, a paired student t-test was used to analyse the difference in mean arousal score between the two contexts. A two-way mixed model ANOVA was used, with context as the within-subject variable and breed, sex, size, experience of dog, and homing history as the between-subject variables.

**Handler Observations**
Handler accuracy was compared between the two contexts using a sign test, whilst handler mood scores were compared between the two contexts using a paired t-test.

**Results**

**Performance of arousal behavior immediately prior to participating in agility**

Individual behaviors -performed with both significantly greater frequency and duration in the competition compared to the training context were ‘alert posture’ ($p < 0.05$ for both comparisons) and ‘lowered tail’ ($p < 0.01$ for both comparisons) (Figure 1). The frequency of
dogs holding ‘ears backwards’ was significantly lower in the competition compared to the training context ($p < 0.04$). The frequency of response to distractions ($p < 0.01$), lunging on the lead ($p < 0.01$), and body shake ($p < 0.05$) were higher whilst that for barking was lower ($p < 0.01$) in competition compared to the training context (Figure 2).

Arousal Scores

Overall, mean arousal score was greater for dogs in the competition context than in training ($p < 0.001$) (Figure 3), although there was some variation between individual dogs.

There was a significant effect of breed ($F(1,18) = 6.18, p = 0.02$) and agility experience ($F(1,18) = 5.53, p = 0.03$) on arousal score, whereby herding breeds exhibited higher mean arousal scores than the ‘other breeds’ group (Figure 4a), and ‘dogs with ≤ 36 months’ experience’ of taking part in agility competitions had higher mean arousal scores than more experienced dogs (Figure 4b). There was no significant effect of sex, homing history or size on arousal scores, nor were there any interactions between context and any of the independent variables.

Handler accuracy of observation
All handlers observed fewer behaviors than the investigator viewed on video in both contexts (Figure 5), with the exception of one handler in the competition context. There was no significant difference between the mean handler accuracy score between the two contexts.

**INSERT FIGURE 5 HERE**

*Handler Mood Score*

Mood score to which handlers attributed themselves was higher in competition, indicative of more perceived stress in the competition context ($p = 0.00$) (Figure 6).

**INSERT FIGURE 6 HERE**

**Discussion**

The aims of this study were to assess the behavioral signs of arousal exhibited by dogs shortly before participating in an agility competition compared to that in a training context, to examine the accuracy of the handlers in observing the level of arousal in their dogs in each context and influence of handler mood on this accuracy. It was predicted that in the competition context dogs would perform a greater number of arousal behaviors, with greater frequency and longer duration, than during training and that handlers would be less accurate at observing their dog’s behavior in competition.

*Individual behaviors indicative of arousal*

A difference in intensity of individual behaviors between the two contexts was observed in five out of the 25 behaviours measured, indicating that dogs in competition were more aroused than they were in training. This is illustrated by changes in the frequency and/or duration of individual behaviors. Alert body posture and lowered tail behaviors were performed significantly more often and for longer in the competition context than in training.
Whilst high muscle tone and upright posture indicates confidence and preparation for locomotion (Kiley-Worthington, 1976), lowering of the tail denotes a reduction in confidence (Kiley-Worthington, 1976). These different behaviors may reflect the difference in valence assigned to stimuli by individual dogs, in that some dogs may feel optimism, excitement and anticipation or similar positive emotion at the start of an agility run, whilst others might feel anxious or experience other negative emotions. However, some dogs performed both alert posture and lowered tail behaviors, suggestive of apparently conflicting emotions, which may be due to adaptive responsiveness to factors within the context or possibly frustration, perhaps because of inability to perform a desired action such as beginning the agility run (Landsberg, Hunthausen & Ackerman, 2013). These results suggest that some dogs may benefit from further training to establish a calmer response to waiting.

In the current study, frequency of lowering the tail was greater in the competition context than in training suggesting that dogs in the competition context may have been experiencing uncertainty, or possibly mild fear. Abrantes (1997) describes tail wagging as an act to emphasize signals and emotions other than just happiness, and a slow wag was considered a signal of uncertainty, particularly when coupled with a lowered tail posture. Stellato, Flint, Widowski, Serpell & Niel (2017) described some tail wagging as a sign of fear and recorded an increase in frequency of low tail wags whilst the tail was held in a position lower than the plane of the spine in dogs known to be in a fear-induced state. So practically, the speed of movement and posture of the tail may be useful indicators to handlers of a change in emotional state of their dog.

The frequency of lunging on the lead was also higher for dogs in competition, and in two cases this occurred five times in the 90 second period prior to commencing the run. Lunging on the lead is often considered an agonistic distance-increasing behavior (O’Heare, 2014) when a dog is fearful of a given stimulus. In competition, queuing for a run entails
being near to several unfamiliar dogs, so some of the subjects may have been experiencing fear. Alternatively, lunging on the lead can also be a distance-decreasing behavior in dogs who want to interact with other dogs or people (Bowen & Heath, 2005), i.e. in a positive way. Bray, MacLean & Hare (2015) found that dogs that were more aroused had less impulse control, so perhaps in some cases lunging on the lead was an over-exuberant response to a signal from the handler (e.g. to move forward). This, like so many other behaviors, must be viewed in the context of surroundings, antecedents and consequences to determine motivation.

Displacement behaviors are behaviors displayed out of context (Landsberg et al, 2013) and are sometimes seen when a dog is experiencing stress, taken to refer to a negative emotional state or distress, and has no alternative way of alleviating the stress or avoiding the stressor. In the current study, body-shaking, a displacement behavior (Stellato et al, 2017) was significantly higher in frequency in the competition context, particularly when the dog was released from the lead. Scholz & von Reinhardt (2007) suggested that body shaking is an attempt by the dog to physically relive itself of stress. If removing the harness had been a release of frustration caused by the restriction of movement, then presumably shaking would have been equally prevalent in both contexts. The fact that this was not the case suggests that a body-shake indicates a response to emotional changes for the dog in the competition context and as such it could be an obvious signal of stress for handlers to watch out for.

Whilst there was a significant increase in the number of different behaviors performed during competition, as measured by arousal score, there were fewer differences observed amongst the individual behaviors themselves, with only five behaviors measured as being significantly different between contexts. The lack of major difference of intensity of behaviors between contexts could be partly explained by the extent of similarity between the
two contexts examined in this present study, namely the equipment and cues from the handler, which were very similar in both contexts.

**Effect of competition context on arousal score**

Arousal scores, representing the total number of different arousal behaviors presented in the 90 s period immediately before participating in agility, were significantly higher for dogs in competition than in a training context. Pastore et al (2011) found that dogs experienced increased arousal at agility competitions. However, unlike Pastore et al’s study, we have isolated the context (i.e. agility competition) as one contributory factor in the dogs’ heightened state of arousal from the physical activity.

Whether a dog experiences arousal as negative is subjective and context-specific and depends on factors including the dog’s prior experiences and its prevailing physiological state (Moberg, 2000). The current study does not attempt to determine whether any observed changes in dogs’ arousal behaviors are due to excitement and eustress or early signs of distress. However, prolonged exposure or frequent re-exposure to any stimuli that trigger arousal responses, regardless of the dog’s outlook, can lead to depleted reserves and a physiological state of distress (Carstens & Moberg, 2000). This is of note because dogs who participate in agility are exposed to many stimuli simultaneously and over many hours during a competition, and sometimes over several days.

Higher arousal scores during competition suggest that dogs were responding to the larger number of environmental stimuli, such as the greater noise, movement of other dogs and people, and possibly the anticipation of participation in an event (McBride & Mills, 2012). Anticipatory responses indicative of increased arousal have also been found in sled dogs (Angle et al, 2009), where serum cortisol concentration was increased when dogs were exposed to predictive stimuli such as their harnesses, as well as racing greyhounds whose heart rate increased significantly when watching other dogs racing (Gillette, Angle, Sanders
Dogs have also been shown to synchronize emotional states with their handlers during an agility competition (Buttner, Thompson, Strasser & Santo, 2015), so some dogs may have been empathising with the increased stress of their handler in the competition context, as suggested by the increase in handler mood score as the handlers’ perception of their own level of stress.

It is important to note that all dogs in the current study exhibited some arousal-related behaviors in the training context, and for three individual animals the arousal score in training was higher than the mean overall competition arousal score. This may have been because simply seeing the agility equipment in the training ring was a predictive cue, leading to anticipatory arousal in this context (Angle et al, 2009), or it may be representative of the variation in natural arousal levels of individual dogs. In further research, it would be useful to determine a baseline for each dog ‘at rest’ e.g. to assess the arousal levels of the dog relaxing at home, because breed characteristics (Lit, Schweitzer & Oberbauer, 2010; Arons & Shoemaker, 1992), individual personality such as how confident a dog is (Svartberg, 2002), how optimistic is its outlook (Mendl et al, 2010) or its prior learning (Beerda, Schilder, van Hooff & de Vries, 1997) may all influence the dogs’ baseline score and subsequent response to the equipment.

**Effect of breed type on arousal scores**

Herding breeds exhibited higher arousal scores compared to other breeds, regardless of context, albeit a subgroup consisting of small numbers. Herding breeds, such as Border Collies have been selectively bred for an exaggerated eye-stalk-chase sequence of the predatory motor sequence associated with hunting animals (Coppinger & Coppinger, 2001) and thus are likely to be sensitive to, and more aroused by, movement and novelty. This breed difference in arousal has been reported to be higher in herding compared to retrieving breeds (Lit et al. 2010) and Arons & Shoemaker (1992) found higher levels of
neurotransmitters within brain tissue in Border Collies than in Siberian Huskies, levels which corresponded with ‘excitability’ levels.

**Effect of prior experience on arousal scores**

Dogs that had 36 months or less experience of training or competing in agility had higher arousal scores than those with greater experience. However, it is again acknowledged that the subgroup consisted of a small sample size. Pastore et al (2011) found that in dogs, urination, one of their behavioral measures of arousal, was mostly displayed by the youngest and least experienced dogs and was considered to indicate anxiety or excitement.

In the case of agility, more experienced dogs will have been exposed to and therefore may be better habituated to competition conditions. Rooney, Gaines & Bradshaw (2007) found that dogs which had been habituated to kennel confinement were less stressed (i.e. lower urinary cortisol and creatinine levels) than dogs who had not previously been habituated. The results may include an element of handler experience, whereby handlers who have worked with their dogs for longer have, over time, introduced measures to reduce the potential negative impact of novelty. For example, some handlers introduce play or train the dog to focus on the handler to minimize response to distractions.

**Handler appraisal of their own emotional state and their dog’s arousal**

Had a difference between handler observation accuracy in the two contexts been noted, it could be argued that increased arousal levels of the handler meant that their attention towards their dog was disrupted (Chu, Todd, Beilock & Lleras, 2010). However, handlers observed fewer arousal behaviors than were performed by their dogs in both training and competition contexts than the investigator, suggesting that even with an increase in self-perceived handler stress in the competition context, this did not negatively influence handler capacity to observe in the competition context. Despite being experienced in interacting with dogs, handlers’
knowledge of behaviors indicative of increased arousal in their dogs may be incomplete, as suggested by Mariti et al (2012). In previous studies (Tami & Gallagher, 2009; Dalla Costa et al, 2014) where observers have been accurate at identifying the emotional state of a dog from pictures or video, it has subsequently become apparent that the observers have used specific body parts, such as the tail, to influence their judgement (Wan et al, 2012). If handlers of agility dogs were trained to observe specific key features of their dog, such as tail movements and visual behaviors in the period leading up to starting their run, and to include such observation in their pre-competition preparation routine, then they may be able to identify and act upon signs of arousal in their dog. This could lead not only to improved success of the handler-dog partnership in competition, but also to minimize levels of stress in competing dogs, which would be a clear benefit to dog welfare.

In addition, as mentioned previously, prolonged exposure to stimuli that trigger arousal responses can lead to depleted resources, even for dogs experiencing enjoyment, so that the welfare of all agility dogs needs to be carefully monitored. Ideally this would be by an independent person such as a competition judge to remove the effect of handler, during and after agility competitions, especially when they take place over consecutive days.

For some dogs, their participation at agility competitions may need to be more carefully monitored and/or limited, or alternative activities should be considered, such as scentwork or a less intense dog sport such as ‘hoopers’, where the handler guides the dog around a predetermined course, but the obstacles require less intense physical behaviors than agility e.g. running underneath a hoop, rather than jumping or climbing. If, as O’Heare (2011) suggests, a broader behavioral repertoire promotes increased resilience in dogs, these benefits could be gained in alternative activities.
In conclusion, despite the potential that the two contexts investigated were in reality not dissimilar, the results show that exposure to the contextual stimuli of a competition, as distinct from the agility equipment and physical activity of running around the agility course, can lead to increased arousal in dogs. This may adversely influence not only the performance of the dog-handler partnership in competition, but also the welfare of the dog, particularly if the dog perceives the experience as negative, or is participating in competition over a longer period of time. Handler’s self-assessment observations suggest that handlers may be either unaware of, or are unable to identify, the behavioral signs of increased arousal in their dog when preparing to participate in agility, irrespective of their own perceived level of stress. This raises concerns that some handlers may not be able to identify and act upon increased arousal levels in their dogs, particularly in those dogs which are prone to distress. Indeed, for some dogs, alternative canine activities may be deemed more suitable than agility. Further investigation of the effects of agility competition on the emotional valance of dogs is necessary, including the cumulative impact of competitions held over several days. The findings could also be applied to other canine activities in which training the dog takes place separately from the context in which they are required to perform, for example gun sports or those participating in obedience competition. This could improve the chances of success for every dog-handler partnership, enhance the welfare of participating dogs and indicate when the welfare of an individual dog may be at risk.

Disclosure Statement

The authors report no conflict of interest.

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