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RESEARCH ARTICLE

Objectifying working animals: The interplay of morality, empathy, and social norms

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ABSTRACT

Working animals such as police dogs, guide dogs, and draft animals occupy an ambiguous position between indispensable tools and sentient partners, rendering their objectification a pressing ethical concern. Although philosophical work on speciesism and animal capabilities is extensive, the psychological mechanisms that inhibit or reinforce the objectification of working animals remain insufficiently explored. The present study examines how moral sensitivity, empathy toward animals, and perceived social norms jointly shape attitudes toward the objectification of working animals and tests a dual-pathway mediation model. A two-wave cross-sectional online survey was conducted with a Chinese community sample (N = 875), and data were analyzed using structural equation modeling with bootstrapped mediation tests. Moral sensitivity, empathy, and protective social norms each showed significant direct negative associations with objectification attitudes. Empathy and social norms partially mediated the link between moral sensitivity and objectification, with the social-norm pathway accounting for a larger proportion of the total effect. These findings suggest that resistance to the objectification of working animals is jointly driven by internal moral identity, cross-species emotional resonance, and the perceived strength of protective social norms. The study extends social-psychological theories of moral motivation and norms to the domain of human–animal relations and provides a theoretical basis for interventions that seek to reduce animal objectification by enhancing moral sensitivity, cultivating empathy toward animals, and strengthening protective social norms.

Keywords: working animals; objectification; moral sensitivity; empathy toward animals; social norms

1. Introduction

Across ethical theory, psychology, and sociology, animal welfare has become an increasingly prominent topic. Ethical philosophers debate the moral status of animals and the legitimacy of using them for human purposes; psychologists investigate the emotions, cognitions, and moral judgments that shape human responses to animals; sociologists analyse how institutions, economic structures, and cultural norms organize human–animal relations. Yet, despite this multidisciplinary attention, the lives of working animals—such as police dogs, guide dogs, draft animals, and rescue animals—remain under-theorised and insufficiently protected in everyday practice.

Working animals occupy a particularly ambivalent position. On the one hand, they provide

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indispensable services for public safety, disability support, and agricultural production[1] [2]; on the other hand, they are sentient beings with the capacity to suffer and species-specific needs[3] . In practice, however, they are often managed as labour instruments or technologies, even as they are rhetorically described as "partners" or "family members" [4]. This dual status—at once tool and life—creates a structural tension at the heart of contemporary debates about animal welfare. Different disciplines address this tension in partial and sometimes conflicting ways: ethical debates tend to focus on abstract principles, psychological work on individual attitudes and emotions, and sociological studies on institutional arrangements and social norms. Consequently, the relationship between the instrumental and biographical dimensions of working animals' lives remains insufficiently understood.

One influential way of articulating this conflict is through the notion of objectification: the reduction of a living being to a replaceable object or instrument [5]. Contemporary animal ethics has criticised the objectification of animals in science, agriculture, and entertainment, arguing that animals should be regarded as subjects with intrinsic value rather than mere means to human ends[6,7]. Working animals epitomise the difficulty of sustaining this normative stance under conditions of practical necessity and institutional pressure. In everyday work settings, people must balance concern for animal welfare against demands for efficiency, safety, and economic productivity; the ethical implications of this trade-off remain deeply contested.

From a psychological perspective, this tension can be analysed in terms of how people perceive and respond to the moral significance of working animals. Three factors are particularly salient: moral sensitivity, empathy towards animals, and perceived social norms [8] [9] [10]. Moral sensitivity refers to the capacity to recognise the moral implications of a situation and to identify whose interests are at stake. Empathy towards animals involves understanding and sharing their affective states, enabling people to see them as experiencing subjects rather than mere objects. Perceived social norms capture the expectations communicated by peers, organisations, and wider society regarding how working animals may legitimately be used and cared for. These factors may either reinforce the treatment of working animals as tools—for example, when moral salience is overlooked, empathy is muted, and norms prioritise productivity—or support the recognition of working animals as living beings, thereby reducing the ethical tension between instrumentalisation and respect for animal welfare.

Integrating insights from ethics, psychology, and sociology, this study conceptualises the objectification of working animals as an outcome of both individual psychological processes and socially embedded normative expectations. We examine how moral sensitivity, empathy towards animals, and perceived social norms—drawing on moral psychology, social neuroscience, and sociological theories of normativity—jointly shape how people conceptualise and evaluate working animals. By investigating these mechanisms within an integrated framework, we aim to clarify how the contradiction between viewing working animals as instruments and as living beings is reproduced in everyday cognition, and how it might be mitigated through heightened moral sensitivity, strengthened empathy towards animals, and supportive social norms.

2. Literature review

Working animals are domesticated and trained to perform human-assigned tasks, including service animals (e.g., guide dogs), labour animals (e.g., draft oxen, logging elephants), and research animals. In many settings, they are essential to sustaining livelihoods, public safety, and economic production. Yet these relationships often prioritise animals' instrumental functions while neglecting their capacity for suffering and their need for species-typical behaviours.

Objectification is sustained by contextual forces that vary across settings. In technologically intensive agricultural and industrial systems, it can be reinforced by techno-managerial practices. Precision Livestock Farming (PLF), for example, uses continuous monitoring to optimise performance; although PLF may improve efficiency and resource use, it can also frame animals primarily as data points or production variables, weakening moral attention to them as sentient beings [11] [12] [13]. Related analyses drawing on Actor–Network Theory suggest that industrial farming embeds animals within production networks where they are represented mainly through quantifiable indicators (e.g., weight gain, milk yield), which can foster "ethical alienation" and dampen moral sensitivity [14] [15]. In resource-constrained contexts, objectification is also common but is more directly shaped by poverty, limited veterinary access, and survival imperatives, which can normalise chronic overwork and inadequate care [16] [17] [18]. Cultural and religious frameworks further influence whether working animals are regarded as companions, family-like members, or utilitarian resources, thereby shaping the social acceptability of objectifying practices [19] [20].

Ethical theories—including critiques of speciesism and the capabilities approach—converge in arguing that animals have intrinsic value that constrains purely instrumental use [7] [21] [22]. Within this tradition, objectification provides a useful concept for analysing labour-related exploitation. Nussbaum defines objectification as treating a being as a thing (e.g., instrumentalisation, denial of autonomy, and fungibility) [23] , and later work in animal ethics extends this framework to show how animals' interests and subjectivity may be systematically subordinated to human purposes[24]. For working animals in particular, objectification is not only a philosophical concern but also a practical moral problem embedded in institutional routines and economic pressures.

While these ethical theories articulate compelling normative reasons to resist animal objectification, they often remain at a macro level and provide limited insight into the psychological processes through which individuals either reproduce or challenge the objectification of working animals in everyday life. To understand how the tool–life tension is enacted in concrete interactions, it is necessary to integrate these ethical perspectives with research in moral psychology, and sociology on moral sensitivity, empathy, and social norms.

Moral sensitivity refers to an individual's ability to detect and interpret the moral dimensions of a situation and to recognise that the interests or rights of others are at stake[25] [26]. Evolutionary accounts emphasise that human moral capacities evolved from social instincts, such as reciprocity and fairness, which facilitated cooperation and group survival among social animals[27]. These biological roots provide a basis for extending moral concern beyond the human species. From the perspective of Moral Foundations Theory, moral judgements are rooted in multiple intuitive foundations such as care, fairness, loyalty, and authority[28]. Individual differences in the strength of these foundations contribute to variation in moral sensitivity, including sensitivity to harms inflicted on animals.

Contemporary neuroscience further suggests that moral decision-making depends on the interaction between affective and cognitive systems in the brain. Regions such as the amygdala and anterior insula are implicated in empathic and affective responses, whereas prefrontal regions support rule-based reasoning and deliberation[29]. When people confront a moral dilemma, rapid affective reactions to others' distress are evaluated and sometimes overridden by more reflective cognitive processes. Research on psychopathy illustrates the importance of these affective components: individuals with psychopathic traits often display deficits in empathy and moral concern, which impair their responsiveness to others' suffering[30] [31]. These findings highlight that moral sensitivity is not merely a matter of abstract reasoning but is deeply grounded in affective and neurobiological processes.

Applied to human–animal relations, moral sensitivity shapes whether people perceive animals as beings with intrinsic value or merely as means to human ends. Empirical studies indicate that individuals with higher moral sensitivity are more inclined to acknowledge the subjective experiences and social capabilities of animals and to assign a higher moral status to them[32] [33]. Developmental psychology further suggests that empathy and mechanisms of moral judgment in early childhood are highly plastic[34], implying that moral sensitivity toward animals can be cultivated. In parallel, ethological research documents complex, morally salient behaviours in non-human animals[35]. Such as fairness in wolf play and consoling behaviour among elephants—have been interpreted as evidence that many animals themselves participate in norm-like social practices[36]. Together, these findings support the view that animals can be regarded as moral subjects rather than mere tools and may in turn enhance human moral sensitivity by prompting a re-evaluation of human–animal relationships. In the context of working animals, moral sensitivity should therefore be negatively associated with objectifying attitudes: people who recognize working animals as moral subjects are less likely to endorse their reduction to mere instruments.

Empathy is a central mechanism through which moral sensitivity is translated into concern for others. It can be defined as the capacity to understand and share the emotional states of others. Davis proposes a multidimensional framework distinguishing cognitive empathy—the ability to infer others' mental states—from affective empathy—the tendency to share or resonate with others' emotions[37]. Empirical research indicates that these components are related but separable; individuals may differ in their tendency to engage in perspective-taking versus emotional resonance[38].

Social neuroscience has provided converging evidence for shared neural substrates of human- and animal-directed empathy. Observing others in pain activates regions such as the anterior insula and anterior cingulate cortex, which are also engaged when individuals experience pain themselves[39]. Extending this work, Mathur et al. found similar patterns of neural activation when participants perceived suffering in humans, animals, and even nature, suggesting that cross-species empathic responses rely on partially overlapping neural circuits[40]. Behavioural findings further indicate that such empathy can reduce the tendency to objectify animals: exposure to images or narratives of animal abuse elicits empathic responses and increases support for animal welfare, in part through activation of prefrontal–limbic pathways involved in emotional regulation[40]. Together, these results suggest that the neural systems enabling concern for other humans can also be recruited on behalf of animals, thereby undermining their treatment as mere objects.

Social norms are defined as the collectively shared and adhered-to behavioral standards and expectations within a specific society or group, which prescribe what constitutes "appropriate" or "obligatory" conduct in given situations[41]. According to Cialdini et al.'s Focus Theory of Normative Conduct, social norms can be categorized into two types: descriptive norms (perceptions of how others typically behave in a situation) and injunctive norms (perceptions of what society approves or disapproves of) [42]. Norms contribute to social order by maintaining behavioral consistency and predictability, thereby both structuring and constraining social action.

At a deeper level, social norms fundamentally define the identity and status of animals across cultures, thereby exerting a systematic influence on individual moral judgments. Delon contends that social norms operate not only at the individual level but also construct the differential status of animals as either "objects of protection" or "commodities" at the collective level[43]. This variation reflects how power structures legitimize animal objectification through a human-animal dichotomous discourse. Extending this argument, Roughley suggests that normative systems construct non-human animals as the "Other" through language, law, and practice, reinforcing their legitimacy as objects of management[44]. This process institutes a form of

structural violence that perpetuates human dominance over animals. It is crucial to emphasize the dynamic nature of social norms. Changes in norms can significantly attenuate objectifying attitudes toward animals. The recent rise of animal welfare legislation, for instance, is gradually shifting public perceptions. Research indicates that disseminating messages supporting animal welfare can effectively reduce meat consumption[45], demonstrating that by shifting group reference standards, positive normative change can enhance moral sensitivity and inhibit objectification tendencies. Consequently, understanding the dynamism of social norms and their interaction with moral sentiment is pivotal for building more just and sustainable human-animal relationships.

3. Hypothesis

Taken together, this literature provides rich normative arguments against the objectification of animals but offers relatively little insight into the concrete psychological processes through which individuals either resist or reproduce the objectification of working animals in everyday contexts. In particular, few empirical studies have simultaneously examined how moral sensitivity, cross-species empathy, and perceived social norms interact to shape attitudes toward working animals. To address this gap, the present study develops and tests a social-psychological model of working-animal objectification that integrates these three factors within a unified framework.

Based on the theoretical framework outlined above, this study proposes the following hypotheses:

H1a：Moral sensitivity will be negatively associated with the objectification of working animals.

H1b：Empathy towards animals will be negatively associated with the objectification of working animals.

H1c：Perceived social norms regarding the protection of working animals will be negatively associated with their objectification.

H2：Empathy towards animals will partially mediate the relationship between moral sensitivity and the objectification of working animals.

H3：Perceived social norms will partially mediate the relationship between moral sensitivity and the objectification of working animals.

H4：Empathy and perceived social norms will sequentially mediate the relationship between moral sensitivity and the objectification of working animals. That is, higher moral sensitivity will be associated with greater empathy towards animals, which in turn will be associated with stronger perceptions of protective social norms, ultimately leading to lower levels of objectification.

4. Method

A cross-sectional online survey was administered via the Wenjuanxing platform. Participants were recruited across China through anonymous sampling procedures. Participation was voluntary, and all participants provided informed consent before completing the questionnaire. The protocol and materials were approved by the ethics committee of the authors' affiliated university, and all procedures complied with relevant national and institutional guidelines. To reduce common method bias, data were collected in two waves, with the second wave administered one month after the first.

A total of 950 questionnaires were distributed. The initial number of returned questionnaires was 879, yielding a preliminary response rate of 94.10%. After a rigorous screening process, which involved the

removal of 19 invalid responses based on predefined criteria (patterned responses, e.g., eight consecutive identical answers, and failure in attention checks), a final sample of 875 valid responses was retained for analysis. The final valid response rate was 92.21%, indicating high data reliability and satisfactory participant engagement.

Preliminary data screening and management were conducted using SPSS 23.0 to ensure data quality and integrity. To examine the complex relationships between the objectification of working animals, moral sensitivity, empathy, and social norms, Structural Equation Modeling (SEM) was employed as the primary analytical method. Path analysis and mediation effect analysis were performed using AMOS software. Furthermore, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted using SPSS and AMOS, respectively, to evaluate the reliability and validity of the measurement scales.

4.1. Measure

The Animal Objectification Scale (AOS) was developed to assess the tendency to view animals as "instrumental objects" rather than "embodied living beings."The scale was adapted from the Objectified Body Consciousness Scale[46] and revised for human–animal interactions. We also drew on the "Five Freedoms" framework[47] to ground items in basic welfare needs. On this basis, we specified three dimensions: Instrumentalization, Emotional Neglect, and Welfare Deprivation. Instrumentalization captures reducing animals to tools (e.g., "Working animals do not need names; it is more convenient to manage them with numbers"). Emotional Neglect assesses the absence of emotional bonding and includes reverse-scored items (e.g., "Working animals need to establish emotional connections with humans"). Welfare Deprivation captures denial of basic welfare needs (e.g.,"The accommodation for working animals does not need to consider comfort").

The AOS was validated through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). An initial pool of 15 items was examined with EFA in a pilot sample $N=200$. We removed three items with communalities below 0.50, resulting in a 12-item version for the main study. We then conducted EFA in a random half of the main sample $N=438$. The KMO value was 0.920 (> 0.70), and Bartlett's test was significant, indicating suitability for factor analysis. Using principal component analysis, we extracted three factors that explained 71.644% of the variance. Items loaded on the intended factors (> 0.50) with no substantial cross-loadings. The rotated solution was consistent with the proposed dimensions (Instrumentalization, Welfare Deprivation, and Emotional Neglect). We conducted CFA in the remaining half of the sample $N=438$. Internal consistency was high (Cronbach's $\alpha = 0.922$), and fit indices indicated good fit ($\chi^2/df = 1.677$, RMSEA = 0.039, CFI = 0.992, TLI = 0.990, RMR = 0.021).

The Public Perception of Social Norms Regarding Working Animals Scale was adapted from Guo et al., who examined social-norm drivers of farmers' pro-environmental behaviours[48]. The original instrument assessed descriptive norms (perceptions of prevalent group behaviour) and injunctive norms (perceptions of moral obligation). We retained this two-factor structure and adapted item content to animal protection practices and public expectations about ethical responsibilities toward animals. Sample items include "People in my community (or workplace) prioritise choosing animal welfare-friendly services (e.g., refusing circus performances, supporting guide dog protection organisations)" (descriptive norm) and "The prevailing values in my community (or workplace) oppose animal abuse" (injunctive norm). We evaluated the adapted social norms scale using CFA in half of the main sample $N=438$. Internal consistency was good (Cronbach's $\alpha = 0.886$). Fit indices indicated good fit ($\chi^2/df = 1.912$, RMSEA = 0.046, CFI = 0.993, TLI = 0.990, RMR = 0.016), which was consistent with the proposed two-factor structure.

The Empathy Toward Animals Scale (ETA) was adapted from the Basic Empathy Scale[49]. The original scale distinguishes cognitive empathy (understanding others' mental states) from affective empathy (emotional resonance). We extended this two-factor framework to animals and revised item content accordingly. Cognitive empathy assessed recognising animals' emotions and needs (e.g., "I sometimes try to understand animals by imagining how they see things"). Affective empathy assessed emotional responsiveness to animals' situations (e.g., "I often feel distressed for animals that encounter misfortune"). To examine the reliability and validity of the adapted Empathy Toward Animals Scale, a confirmatory factor analysis (CFA) was conducted on a random half of the total main study sample (N=438). The scale exhibited high internal consistency, with a Cronbach's alpha coefficient of 0.933. The results of the CFA indicated an acceptable model fit to the data: $\chi^2/df = 2.489$, RMSEA = 0.058, CFI = 0.983, TLI = 0.979, RMR = 0.022, thus supporting the hypothesized two-factor structure.

Moral sensitivity was assessed using the Chinese version of the Self-Importance of Moral Identity Scale[50]. The SIMIS measures moral identity through internalisation (integrating moral traits into the self-concept) and symbolisation (expressing these traits publicly). Following prior work, we operationalised moral sensitivity using moral identity centrality. In this paper, "moral sensitivity" refers to this operationalisation. The scale includes 10 items. Participants first read a list of moral characteristics and then rated related statements. Five items measure internalisation (e.g., "Having these characteristics makes me feel good about myself"), and five measure symbolisation (e.g., "The way I dress helps to show that I have these characteristics"). Responses were recorded on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The internal consistency of the scale was evaluated using Cronbach's alpha. The internalization subscale demonstrated good reliability ($\alpha = .78$), while the symbolization subscale showed acceptable reliability ($\alpha = .69$). These results indicate that the scale possesses adequate internal consistency for research purposes.

5. Results

5.1. Descriptive statistics

Descriptive analyses were conducted to summarise the demographic characteristics and relevant experiences of the final sample $N=875$. The sample comprised 59.8% female and 40.2% male participants. Participants were recruited from four major regions of China: Southwest (37.2%), Northeast (24.6%), Northwest (23.7%), and Southeast (14.5%). Most participants (72.7%) had received higher education, with associate or bachelor's degrees forming the largest subgroup; 16.2% reported a high school/vocational diploma, and 5.5% reported postgraduate education. Ages were distributed across cohorts: 18–30 (36.7%), 31–40 (24.2%), 41–50 (17.0%), over 50 (20.1%), and under 18 (1.9%). Regarding animal-related experience, 63.4% reported having raised animals (pets and/or livestock), and 34.5% reported prior contact with working animals (e.g., guide dogs or police dogs).

5.2. Reliability and validity analysis

To ensure the psychometric quality of the measurement instruments, rigorous tests for reliability and validity were conducted. The overall scale showed good internal consistency (Cronbach's $\alpha = .819$). EFA indicated that the data were suitable for factor analysis (KMO = .943; Bartlett's test: $\chi^2 = 24953.560$, df = 861, $p < .001$). Using principal component analysis with varimax rotation, nine factors were extracted, explaining 73.904% of the variance. Item loadings ranged from .627 to .872, and no substantial cross-loadings were observed. We also conducted Harman's single-factor test to assess potential common method bias (CMB). The first unrotated factor explained 30.025% of the variance, which is below the 40% threshold, suggesting that CMB is unlikely to substantially bias the findings.

5.3. Correlation analysis

Pearson correlations were used to examine associations among moral sensitivity (internalisation, symbolisation), empathy (affective, cognitive), perceived social norms (descriptive, injunctive), and objectification attitudes (overall and subdimensions). Both internalisation and symbolisation were negatively correlated with overall objectification, indicating that higher moral sensitivity was associated with lower objectification attitudes.

Descriptive norms showed negative correlations with instrumentalisation ($r = -0.233$), emotional neglect ($r = -0.185$), and welfare deprivation ($r = -0.255$). These associations were modest and varied across subdimensions. Injunctive norms showed stronger negative correlations with instrumentalisation ($r = -0.351$), emotional neglect ($r = -0.377$), and welfare deprivation ($r = -0.445$), suggesting broader normative alignment with reduced objectification.

Affective empathy showed the strongest negative correlation with overall objectification and was particularly associated with welfare deprivation ($r = -0.369$) and emotional neglect ($r = -0.328$). Cognitive empathy was negatively correlated with instrumentalisation ($r = -0.228$) and welfare deprivation ($r = -0.281$), with a weaker correlation for emotional neglect ($r = -0.179$). Because these results are correlational, they do not establish directionality.

Table 1. Correlations among variables (n=875).

Correlation Analysis														
	Sex	Degrees	Age	Pet1	Pet2	IMP	EXP	INSTR	EN	WD	DSN	ISN	AE	CE
Sex	1													
Degrees	.009	1												
Age	-.013	-.297**	1											
Pet1	.101**	-.106**	.048	1										
Pet2	.150**	.003	.024	.452**	1									
IMP	.189**	.000	.050	.302**	.322**	1								
EXP	.124**	-.011	.062	.211**	.225**	.566**	1							
INSTR	-.102**	-.100**	.133**	-.099**	-.200**	-.294**	-.274**	1						
EN	-.102**	-.056	.092**	-.211**	-.308**	-.228**	-.237**	.523**	1					
WD	-.096**	-.065	.101**	-.162**	-.243**	-.343**	-.308**	.526**	.490**	1				
DSN	.057	-.043	-.030	.076*	.057	.273**	.332**	-.281**	-.215**	-.263**	1			
ISN	.092**	.031	-.033	.192**	.242**	.339**	.343**	-.339**	-.241**	-.391**	.461**	1		
AE	.106**	-.040	.004	.098**	.142**	.294**	.264**	-.352**	-.273**	-.397**	.257**	.364**	1	
CE	.078**	.030	-.033	.053	.086*	.202**	.262**	-.240**	-.191**	-.302**	.237**	.264**	.547**	1

**p<0.05 **p<0.001 Pet1 = Have ever raised or kept animals?; Pet2 = Have you ever worked with service animals or working animals?;*

5.4. Confirmatory factor analysis (CFA)

A confirmatory factor analysis (CFA) was conducted using AMOS 24.0 to test the pre-specified theoretical measurement model and examine the construct validity of the measurement tools. The model fit indices demonstrated an excellent fit to the data. The ratio of chi-square to degrees of freedom (χ^2/df) was 1.252, which is below the recommended threshold of 3. The root mean square error of approximation (RMSEA) was 0.017, well below the stringent criterion of 0.05. The comparative fit index (CFI) was 0.992

and the Tucker-Lewis index (TLI) was 0.991, both exceeding the benchmark of 0.95 for excellent fit. The root mean square residual (RMR) was 0.021, indicating minimal residual differences as it is below the 0.05 threshold. This collective evidence from multiple fit indices strongly supports a good fit between the hypothesized factor structure and the observed data. To further evaluate the reliability of the measurement tools, Composite Reliability (CR) and Average Variance Extracted (AVE) were calculated as key metrics. Composite Reliability (CR), which indicates the internal consistency of the latent construct based on its indicators, showed that all CR values exceeded 0.70 (see Table X for specific values), surpassing the minimum acceptable level of 0.60. This suggests high consistency among the indicators for each latent variable. The Average Variance Extracted (AVE), which measures the amount of variance captured by a latent variable relative to the measurement error, revealed that all AVE values were greater than 0.50 (see Table X for specific values), meeting the theoretical requirement. This indicates that the latent variables effectively capture the core variance of their respective indicators, with minimal interference from measurement error. The convergent validity of the scales is supported, as the AVE for each construct exceeded 0.50. Furthermore, discriminant validity was assessed by comparing the square root of the AVE for each construct with its correlations with other constructs. The results confirmed discriminant validity, as the square root of each construct's AVE was greater than its correlations with all other constructs.

In summary, the dual verification through CR and AVE confirms that the measurement tools exhibit good reliability and validity, providing a robust foundation for subsequent statistical analyses.

Table 2. Confirmatory factor analysis.

Confirmatory Factor Analysis Results (N=876)				
Factors	Indicators	Std.	CR	AVE
Instrumental	Instr1	0.801	0.903	0.652
	Instr2	0.777		
	Instr3	0.846		
	Instr4	0.806		
	Instr5	0.807		
Welfare deprivation	Wd1	0.855	0.917	0.736
	Wd2	0.863		
	Wd3	0.873		
	Wd4	0.841		
Emotional Neglect	En1	0.892	0.894	0.737
	En2	0.836		
	En3	0.848		
Implicit	Imp1	0.817	0.898	0.639
	Imp2	0.808		
	Imp3	0.808		
	Imp4	0.792		
	Imp5	0.773		
Explicit	Exp1	0.734	0.879	0.593
	Exp2	0.755		
	Exp3	0.789		
	Exp4	0.776		

Confirmatory Factor Analysis Results (N=876)				
Descriptive Norms	Exp5	0.797	0.907	0.710
	Dsn1	0.817		
	Dsn2	0.854		
	Dsn3	0.863		
	Dsn4	0.837		
Injunctive Norms	Isn1	0.823	0.906	0.708
	Isn2	0.825		
	Isn3	0.862		
	Isn4	0.857		
Affective Empathy	Ae1	0.778	0.922	0.630
	Ae2	0.774		
	Ae3	0.803		
	Ae4	0.786		
	Ae5	0.795		
	Ae6	0.826		
	Ae7	0.796		
Cognitive Empathy	Ce1	0.820	0.905	0.658
	Ce2	0.841		
	Ce3	0.728		
	Ce4	0.840		
	Ce5	0.822		

Table 2. (*Continued*)

Table 3. Discriminant validity test.

Discriminant Validity Test									
	IMP	EXP	INSTR	EN	WD	DSN	ISN	AE	CE
IMP	**0.639**								
EXP	0.631	**0.593**							
INSTR	-0.325	-0.307	**0.652**						
EN	-0.249	-0.261	0.578	**0.737**					
WD	-0.377	-0.341	0.578	0.533	**0.736**				
DSN	0.299	0.372	-0.31	-0.237	-0.287	**0.71**			
ISN	0.372	0.381	-0.373	-0.264	-0.427	0.507	**0.708**		
AE	0.321	0.29	-0.386	-0.296	-0.431	0.284	0.4	**0.63**	
CE	0.224	0.291	-0.272	-0.21	-0.336	0.26	0.292	0.602	**0.658**
AVE Squared	0.799	0.770	0.807	0.858	0.858	0.843	0.841	0.794	0.811

5.5. Structural equation modeling (SEM)

5.5.1. Model fit

This study employed Structural Equation Modeling (SEM) to systematically investigate the causal mechanisms among the variables. The path analysis was conducted using the Bootstrap method (5,000 resamples) to enhance the robustness of statistical inferences. The model fit indices indicated an acceptable fit to the data. The ratio of chi-square to degrees of freedom (χ^2/df) was 4.526, which meets the acceptable threshold of ≤5. The root mean square error of approximation (RMSEA) was 0.064, below the liberal cut-off of 0.08. The comparative fit index (CFI) was 0.964 and the Tucker-Lewis index (TLI) was 0.942, both exceeding the acceptable standard of 0.90. The root mean square residual (RMR) was 0.028, which is below the strict criterion of 0.05. The collective evidence from these multiple indices suggests that the model has an acceptable fit, effectively representing the structural relationships among the variables[51].

5.2. Path analysis

To further examine the relationships between moral sensitivity, social norms, empathy, and the objectification of working animals, path analysis within the SEM framework was performed. The standardized path coefficients in the model (see Table 1) visually represent the direction and strength of the relationships among the four variables.

The results of the path analysis showed a significant negative associated with moral sensitivity on the objectification of working animals (β = -0.167, p= .025). This indicates that individuals with higher levels of moral sensitivity exhibit weaker instrumental perceptions of working animals. When individuals hold stronger moral principles, they are more inclined to perceive working animals as beings with intrinsic value rather than merely as instrumental entities. This finding provides direct support for Hypothesis H1a, confirming the inhibitory effect of moral cognition on the objectification of working animals.

Furthermore, empathy toward animals was also negatively associated with objectification (β = −0.334, p < .001), Specifically, higher levels of empathy towards animals were associated with lower levels of objectification. As a capacity for emotional resonance, empathy enhances an individual's perception of the emotional needs of working animals (e.g., pain, stress), thereby reducing the tendency to simplify them into functional objects. This result supports Hypothesis H1b, suggesting that affective factors play a key role in inhibiting the objectification of working animals.

Finally, perceived social norms were negatively associated with objectification (β = −0.334, p < .001). As collectively shared behavioral standards, social norms are internalized into individual values, indirectly guiding attitudes towards working animals. When the public's perception of protective social norms regarding working animals is stronger (e.g., a consensus that "working animals should enjoy basic welfare"), individuals are more inclined to reject their objectification. This result supports Hypothesis H1c.

Table 4. SEM analysis.

Path Coefficients						
	Unstd.	Std.	S.E.	C.R.	P	Label
Morality --> Empathy	0.622	0.511	0.061	10.278	***	a1
Morality --> SocialNorms	0.782	0.68	0.066	11.871	***	a2
Empathy --> Objectification	-0.29	-0.334	0.047	-6.183	***	b1
Morality --> Objectification	-0.177	-0.167	0.079	-2.242	0.025	c
SocialNorms -- >Objectification	-0.307	-0.334	0.069	-4.432	***	b2

5.3. Mediation analysis

To further investigate the mechanism through which moral sensitivity influences the objectification of working animals, this study examined the mediating roles of empathy and social norms using the bias-corrected bootstrap method (5,000 resamples). The results of the mediation analysis (see **Table 2**) indicated that the direct effect of moral sensitivity on the objectification of working animals remained significant (β = -0.177, $p < .05$). This suggests that even after controlling for the influences of empathy and social norms, moral sensitivity independently inhibits the tendency to objectify working animals.

Analysis of the indirect effects revealed that both empathy and social norms functioned as significant mediators. The indirect effect through empathy was -0.181 (95% CI: [-0.260, -0.120]), and the indirect effect through social norms was -0.240 (95% CI: [-0.381, -0.137]). As neither confidence interval included zero, these mediating effects are statistically significant. This indicates that the influence of moral sensitivity on objectification is not solely direct but is also partially transmitted indirectly through two distinct pathways: the "moral sensitivity → empathy → objectification" path and the "moral sensitivity → social norms → objectification" path. In terms of effect size, the total effect of moral sensitivity on the objectification of working animals was -0.597 (the sum of direct and indirect effects). The mediating effect of empathy accounted for 30.31% (0.181/0.597) of the total effect, while the mediating effect of social norms accounted for 40.20% (0.240/0.597). This result underscores the particularly central role of social norms in transmitting the influence of moral sensitivity, suggesting that collectively shared normative standards, through processes of internalization, can amplify the inhibitory effect of individual morality on objectification more substantially than individual emotional empathy alone.

Based on the statistical significance of the mediating effects (CIs not including zero) and the reasonable proportion of effects, the following hypotheses are supported:

H2 is supported: Empathy plays a partially mediating role in the relationship between moral sensitivity and the objectification of working animals. As an affective-transmission mechanism, empathy translates the emotional core of moral sensitivity (e.g., compassion, responsibility) into a heightened perception of the emotional needs of working animals, thereby attenuating the tendency towards objectification.

H3 is supported: Social norms play a partially mediating role in the relationship between moral sensitivity and the objectification of working animals. As explicit rules reflecting collective consensus, social norms operate via the pathway of "moral cognition → norm internalization → behavioral constraint," transforming individual moral sensitivity into socially-shared behavioral standards that further reinforce the inhibition of objectification.

Table 5. Mediation analysis.

Path Effect Analysis - Mediation Effect							
				CI(95%)			Mediated proportion
Pathway	Parameter	Estimate	SE	Lower	Upper	P	
Morality ->Objectification	direct	-0.177	0.088	-0.356	-0.011	0.036	29.65%
Morality -> Empathy -> Objectification	indirect1	-0.181	0.035	-0.26	-0.12	0.000	30.31%
Morality -> Social-norms -> Objectification	indirect2	-0.24	0.06	-0.381	-0.137	0.000	40.20%
	Total effect	-0.597	0.062	-0.73	-0.483	0.000	100%

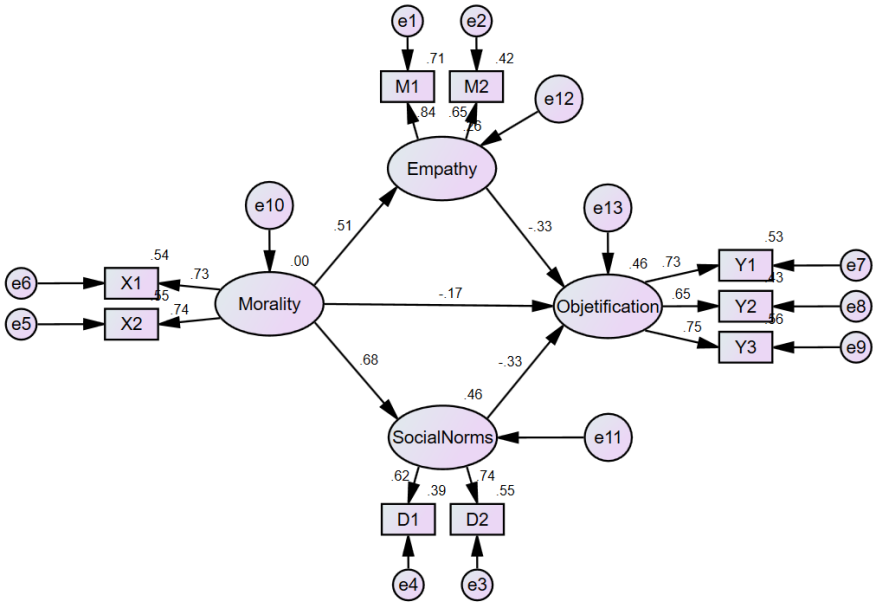

Figure 1. Structure of the model.

6. Discussion

This study examines objectification attitudes toward working animals by modeling how moral sensitivity, perceived social norms, and empathy are associated with such attitudes using structural equation modeling (SEM) and mediation analysis. Within a "morality–norms–affect" framework, the results characterize how these psychological factors relate to objectification attitudes and clarify their internal pathways, offering empirically grounded implications for theory development and for the design of animal-protection interventions. Analyses of 875 valid questionnaires indicated that higher moral sensitivity, stronger perceived protective social norms, and greater empathy were each associated with lower objectification of working animals.

The findings indicate a negative association between moral sensitivity and the objectification of working animals. Specifically, individuals reporting stronger moral sensitivity tended to endorse weaker objectification attitudes, suggesting a closer alignment with viewing working animals as entities with intrinsic value rather than purely instrumental means. This pattern is consistent with Aquino and Reed's Moral Identity Theory, which posits that when moral self-conceptions are salient, judgments and choices are more likely to align with internal moral standards[50]. Conceptually, moral sensitivity may be linked to lower objectification via a moral reasoning grounded in principles such as respect for life and (b) self-consistency processes that motivate alignment between attitudes and one's moral self-concept.

Perceived protective social norms were also negatively associated with objectification attitudes, complementing the role of individual moral sensitivity. Consistent with Cialdini et al.'s Focus Theory of Normative Conduct, descriptive norms (perceptions of what others do) and injunctive norms (perceptions of what others believe one should do) may both be relevant pathways by which norms correspond to attitudes[42]. In this context, stronger perceptions that others respect working animals (descriptive norms) and that one ought to protect them (injunctive norms) may be linked to reduced objectification through conformity pressures and internalized responsibility [52]. These findings underscore the potential "soft-constraint" function of norms in cross-species ethical judgment, particularly where explicit legal guidance is limited and group expectations become prominent reference points.

Empathy was likewise negatively associated with objectification, highlighting the relevance of affective and perspective-taking processes. As a multifaceted capacity encompassing affective resonance and perspective-taking[53], empathy may relate to lower objectification through both (a) affective responses to perceived animal suffering that reduce instrumental framing and (b) cognitive inferences about animal needs that facilitate welfare-oriented appraisal. Notably, the association of cognitive empathy with emotional neglect was smaller than its associations with instrumentalization ($\beta = -0.228$) and welfare deprivation ($\beta = -0.281$), which may reflect the greater role of affective resonance in perceiving and responding to animals' emotional states[54]. Practically, interventions may benefit from targeting both empathy components, for example by combining perspective-taking information with experiential approaches (e.g., immersive simulations of working-animal environments) intended to strengthen intuitive sensitivity to animals' emotional needs.

Mediation models were consistent with indirect pathways in which moral sensitivity was associated with objectification attitudes partly through empathy and perceived social norms, supporting a dual-path conceptualization. Together, these patterns suggest that moral sensitivity correlates with objectification both directly and indirectly via norm-related and empathic processes. This interpretation aligns with social psychological perspectives emphasizing the joint relevance of internalized motives and social context[55]; however, longitudinal or experimental designs are needed to establish temporal ordering and to evaluate causal mediation more definitively.

Despite these contributions, several limitations should be noted. First, reliance on self-report measures may have introduced social desirability bias and common-method variance, potentially inflating observed associations [56]. Second, the study did not differentiate among categories of working animals (e.g., service, agricultural/draft, laboratory), which may mask heterogeneity in objectification and its correlates across functional contexts. Third, the cross-sectional design limits causal inference; accordingly, the findings should be interpreted as associational rather than evidence of directional effects. Fourth, the sample was drawn primarily from China, and the scales were validated in this cultural context; cross-cultural replication, measurement invariance testing, and occupational-group validation are needed to assess generalizability. Finally, potentially relevant covariates (e.g., education, occupational background, and prior animal-related experience) were not comprehensively modeled, and behavioral outcomes were not measured, limiting conclusions about attitude–behavior correspondence and the practical efficacy of proposed interventions.

Future research can extend this work in several directions. First, studies should combine attitudinal measures with behavioral indicators (e.g., donations to welfare organizations, volunteering, reporting harmful practices, or purchasing welfare-certified products) to test whether reduced objectification translates into observable protection-related behavior and to evaluate attitude–behavior correspondence more directly. Second, researchers should differentiate affective and cognitive empathy using validated subscales and examine their potentially distinct associations with specific objectification dimensions. Third, more elaborate models could test moderated associations among moral sensitivity, perceived norms, and empathy—for example, whether empathy buffers the influence of normative pressure on objectification, or whether a stronger moral self-concept amplifies empathic associations with reduced objectification. Finally, where feasible, longitudinal designs and experimental manipulation of empathy (e.g., perspective-taking prompts or immersive exposure) and normative information (descriptive/injunctive norm messaging) would provide stronger evidence regarding temporal ordering and intervention mechanisms. Where sample size permits, stratified analyses across working-animal categories (e.g., service, agricultural, experimental) may further clarify whether determinants of objectification vary by animal role.

7. Conclusion

This study provides a comprehensive examination of the roles played by moral sensitivity, social norms, and empathy in the objectification of working animals, revealing how these factors collectively influence individuals' objectification attitudes through distinct psychological mechanisms. The results demonstrate that moral sensitivity, social norms, and empathy all exert significant inhibitory effects on the objectification of working animals. Specifically, moral sensitivity and social norms not only directly reduce objectification attitudes but also exert their influence indirectly through the mediating pathway of empathy, as evidenced in the dual-path model ("empathy-moral norms-objectification attitude").

A key contribution of this research lies in integrating these psychological variables—moral sensitivity, social norms, and empathy—into a unified framework for studying the objectification of working animals. It elucidates their multi-dimensional mechanisms in reducing objectification tendencies. Furthermore, the study validates the applicability of social psychological theories, particularly concerning the dual influence of moral motivation and external social norms on animal-directed attitudes, within the context of animal protection.

Overall, this research provides a theoretical foundation for promoting animal-protective behavior and offers practical implications for policymakers and practitioners. Specifically, the findings suggest that reducing the objectification of working animals may be supported by strengthening moral identity, reinforcing protective social norms, and cultivating empathy—particularly its affective component. Future research should further examine how these factors operate across diverse contexts and populations to develop more robust theoretical and empirical support for effective animal-protection initiatives.

Conflict of interest

The authors declare no conflicts of interest.

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