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Understanding motivations and attitudes among songbird-keepers to identify best approaches to demand reduction

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Abstract

Demand for cage birds is highly prevalent and increasing across Indonesia, as wild bird populations across Asia decline. To find ways to reduce demand, it is important to understand the motivations and psychographic drivers to keep (or not keep) birds, and how demographic characteristics and public attitudes influence such decisions. Based on surveys with over 3,000 people, we found few people citing health, sanitary, or welfare concerns as reasons for not keeping birds, whereas most people started keeping birds to enjoy their beauty or song, or to keep up with peers. Pet-keepers ("Hobbyists") commonly started doing so opportunistically; song contest participants ("Contestants") and breeders and trainers ("Breeders") did so for financial gain. Bird-keepers and non-bird-keepers disagreed on birds' environmental importance, longevity in captivity, and endangerment by trade. Older respondents were less concerned that keeping birds endangers them and few felt birds to be an important part of the environment. Hobbyists were least likely to consider wild bird population health a major concern. Efforts to dissuade potential bird-keepers should focus on public concern for the environment and the threat bird-keeping poses to wild populations. The importance of peer pressure among bird-keepers presents an opportunity to promote sustainable bird-keeping activities among key groups.

KEYWORDS

cage bird, conservation psychology, consumer demand, sustainable use, wildlife trade

1 | INTRODUCTION

Human behavior underpins almost all biodiversity loss (Schultz, 2011; Veríssimo, 2019). As such, conservation practitioners' efforts to reverse this loss should address the drivers of problematic human behaviors (Bennett et al., 2016). One such suite of behaviors is the overexploitation of biodiversity (Symes, Edwards, Miettinen, Rheindt, & Carrasco, 2018), particularly through the illegal and unregulated trade in wildlife (Ribeiro et al., 2019). In situations where enforcement is ineffective or regulation lacking, which is often the case with trade in wildlife (Cooney & Jepson, 2006; Roe et al., 2020), interventions targeting consumer behavior are an important option for reducing pressure on biodiversity

(Chausson, Rowcliffe, Escouflaire, Wieland, & Wright, 2019). By understanding human attributes such as beliefs, attitudes, social norms, and perceptions of issues, particularly the reasons people give for engaging or not in a particular behavior, interventions appropriate to the characteristics of the target audience can be developed to generate positive conservation outcomes (Jefferson et al., 2015; Kanagavel, Raghavan, & Veríssimo, 2014). Segmenting audiences (both consumers and potential consumers of wildlife) and stakeholders into targetable groups through demographic (e.g., age, education) and/or psychographic (e.g., attitudes, intentions) attributes allows researchers and practitioners to define messages and select channels and influencers that effectively promote proconservation behavior and attitudes (Veríssimo, Vieira, Monteiro, Hancock, & Nuno, 2020).

Researchers have used a variety of approaches to understand the drivers of public perceptions in order to inform conservation management (Bennett et al., 2016; Davis, Veríssimo, et al., 2020; Jefferson et al., 2015). Indeed, mixed-method approaches—including the collection of both qualitative and quantitative data—have been useful in identifying solutions to the problems underlying biodiversity loss (Angula et al., 2018; Lecuyer, Calmé, Blanchet, Schmook, & White, 2019; Mellish, Ryan, Pearson, & Tuckey, 2019). Qualitative social research—gathering information about respondents' values, perceptions and experiences (Chausson et al., 2019; Drury, 2011; Lecuyer et al., 2019)—can illuminate the social aspects of behaviors that lead to the overexploitation of wildlife. Quantitative methods—for example, the use of numeric scales to measure agreement with certain statements concerning positive or negative attitudes toward the environment or conservation issues—have been regularly used to inform conservation education and awareness-raising programs (Kidd et al., 2019; Moss, Jensen, & Gusset, 2017). In seeking to understand decision-maker's behavior, social psychologists have sought to develop theories to model behavioral choices (Kidd et al., 2019). The theory of reasoned action (TRA; Fishbein & Ajzen, 2011) and the theory of planned behavior (TPB; Ajzen, 1991) posit that behavior is determined by behavioral intention and are often used in circumstances when reliable self-reporting on certain behaviors is hard to obtain. Both theories posit that attitudes determine intention, yet the TPB extends the TRA to include perceived behavioral control (the perceived ease or difficulty of performing the behavior) as a predictor of intention (Fishbein & Ajzen, 2011). Further determinants of intention have been proposed, such as subjective norms (the belief that most people approve or disapprove of the behavior: Chen, Lupi, He, & Liu, 2009; Kaiser, 2006), social norms (the customary codes of a group of people that dictate whether a person should enact the behaviors: Chen et al., 2009; Kaiser, 2006), and self-efficacy (the degree to which a person perceives the presence of factors that facilitate or impede performance of the behavior: Janmaimool & Denpaiboon, 2016). A common pitfall with studies utilizing the TRA or TPB is the lack of attention to the behavior–intention gap, wherein the intention to enact a behavior does not always correspond to realization of the behavior (Hassan, Shiu, & Shaw, 2016). However, there is evidence that changes to individuals' intent do lead to changes in actual behavior (Sheeran & Webb, 2016), as such, the utility of TPB in informing interventions aiming to produce behavioral change has been demonstrated in contexts relating to environmental issues (Green, Crawford, Williamson, & DeWan, 2019), including wildlife conservation (Amit & Jacobson, 2017; Janmaimool & Denpaiboon, 2016; St. John et al., 2018).

With over half the population of Indonesia (55% of ~275 M), Java serves as the economic, political, and cultural center of Indonesia. Although Javanese is the largest ethnic group (36% of 275 M), followed by Sundanese, and Chinese, Indonesia is ethnically diverse with over 1,340 ethnic groups, with Jakarta as the most diverse city in the country (Badan Pusat Statistik, 2011). The western provinces of Banten, DKI Jakarta, and West Java are more ethnically mixed with a relatively small Sundanese majority, whereas the eastern provinces of DI Yogyakarta, Central, and East Java are overwhelmingly Javanese. The keeping of birds as pets is considered a traditional pastime with a long history, predating the Dutch colonial period (Iskandar, 2014), particularly among ethnically Javanese males (Hartono, 1990). Traditionally for a balanced life, a Javanese man would require a job (*narpada*), a house (*wismo*), a wife (*garwo*), a horse or vehicle (*turangga*), and a pet bird or hobby (*manuk* or *kukila*) (Hartono, 1990; Iskandar, Iskandar, & Partasasmita, 2019). Due to beliefs surrounding magical and mystical properties, the bird kept following this tradition was the *perkutut* or zebra dove (*Geopelia striata*) (Hartono, 1990). With the patronage of President Suharto, song competitions involving zebra doves gained popularity in the 1970s (Wan, Lun, & Sanders, n.d.). During the 1990s, a new form of songbird competition emerged where species both native and alien to Indonesia (such as canaries *Serinus canaria*) were eligible, growing in popularity among new generations since (Jepson et al., 2011). Today, bird-keeping and songbird competitions are not restricted solely to Java but are widespread across Indonesia (Burivalova et al., 2017; Rentschlar et al., 2018). The recent expansion of bird-keeping and practices has also seen different audiences beginning to engage with the hobby differently, with younger individuals moving toward contests and older individuals typically keeping more traditional species (Marshall et al., 2020b). The Indonesian wildlife trade is valued at up to US$1 billion annually (Marthy & Farine, 2018), of which the cage-bird trade is worth at least

US$80 million annually (Jepson et al., 2011). This cultural and economic importance has often been seen as the principal reason why regulation and enforcement have failed to control the activity, despite its pervasive negative impacts on wild populations of many native taxa (Birdlife International, 2020; Eaton et al., 2015; Indraswari et al., 2020; Jepson et al., 2011; Leupen et al., 2018). Efforts have been made to promote and solidify demand for captive-bred alternatives (Jepson et al., 2011), yet concerns persist among the breeding community that the protected status of birds would increase bureaucracy and reduce financial feasibility (Maizura, 2018). Furthermore, as bird-keeping is considered an important tradition, there is a lack of reflection in regard to its purpose (Kuligowski, 2014) and wider impact that hampers interrogation of how to improve the sustainability of such practices, demonstrating the complexity of finding conservation solutions to the issue.

Research has so far predominantly focused on the spatiotemporal and demographic aspects of bird-keeping (Indraswari et al., 2020; Marshall et al., 2020a, 2020b), and as yet little attention has been paid to wider public attitudes to the trade and its effect on wild bird populations in Java. We seek to identify patterns in the attitudes, beliefs, and intentions of bird-keepers and non-bird-keepers that will help guide demand-reduction efforts, by pinpointing issues and attitudes that could be the focus of conservation education and awareness-raising initiatives. Specifically, we explore the reasons and beliefs that underpin decisions both to start and to stop keeping birds, as well as never to keep them, and how these reasons and beliefs might differ across age and user groups. We identify differences in attitudes and beliefs, in terms of bird conservation and welfare across the different groups, and explore the potential drivers of intentions to keep wild-caught birds among Java's people.

2 | METHODS

2.1 | Survey design and sampling

Between January and October 2018, we collected data on attitudes and perceptions toward bird-keeping and the wider environment during a household survey across Java, Indonesia, sampling a spectrum of both rural and urban districts (further details on sampling methodology can be found in the Appendix A). Prior to data collection, interviewers (2–4 per team) gained permission from, and agreed to stipulations set by, the relevant administrative authorities (community or neighborhood leaders). To ensure a representative sample with a 10% error margin at the 95% confidence level, a predetermined target number of surveys to be completed (90–120 depending on the number of households present in the population) was set for each district (Newing, 2010), which was used to inform the selection and sampling of neighborhoods until the target number was met. Within districts, communities were selected randomly, while households were sampled systematically. We followed the Indonesian Statistics Authority's household typology, where a family unit constitutes an adult, spouse, and all children below the age of 16 (further examples in Badan Pusat Statistik, 2010). Surveys were completed with the principal bird-owner, who in the large majority of cases was also the most senior household member, where this was not the case (i.e., either the bird-owner was not present or no one in the household had ever owned birds), the survey was conducted with the most senior household member available. When the principal bird-owner was not present, their absence was recorded, and respondents were asked a reduced set of questions which could be directly verified by the interviewer or were pertaining to their personal opinion. Data from households where the principal bird-owner was not present were only used in the analyses of the socioeconomic attributes of bird-keeping and non-bird-keeping households.

We used a structured household survey divided into demographic characteristics and bird ownership sections (see Marshall et al., 2020a, 2020b) and two further mixed-methods sections collecting qualitative and quantitative data (Creswell & Clark, 2007; Lecuyer et al., 2019). These additional sections gathered (a) qualitative data on reasons for starting, stopping, and not keeping birds and (b) quantitative data on respondents' attitudes and perceptions toward bird-keeping, wild bird populations, and the natural environment in general and their intention to purchase wild-caught birds in the near future (see Appendix B for full survey instrument).

Qualitative questions (i.e., open responses) were evaluated using a grounded theory approach (Olmedo, Sharif, & Milner-Gulland, 2018), whereby responses were initially coded by five individual coders, with common categories (e.g., lack of time to tend pets) emerging and developed iteratively (Kelly, Fleming, & Pecl, 2019). This approach allows common themes (categories) to emerge from responses without limiting respondents' original answers to a predefined set (Kelly et al., 2019); final categories were then obtained by the team of coders through reviewing, comparing, and redefining the common categories collaboratively and regularly. The quantitative questions focusing on respondent attitudes and intentions used 5-point Likert items to measure self-reported levels of agreement with statements (St. John et al., 2018). Based on previous research in the region (Jepson, 2010), we developed a series of statements focused on the respondents' appreciation of wild birds, bird-keeping, and the environment to explore what

attitudes were shared across stakeholder and demographic groups (e.g., bird-keeping user groups, age groups; see Table 1). We also developed questions based on the TPB to cover various potential predictors (Heath & Gifford, 2002; Klöckner, 2013; St. John et al., 2018) of reported intention to obtain wild-caught birds, including: *Attitudes*: the degree to which a person has a favorable or unfavorable evaluation of the behavior; *Subjective norms*: the belief that most people approve or disapprove of the behavior; *Social norms*: the customary codes of a group of people that dictate a person *should* enact the behaviors; *Self-efficacy*: the degree to which a person perceives the presence of factors that facilitate or impede performance of the behavior; *Perceived behavioral control*: the degree to which a person perceives the ease or difficulty of performing the behavior; and *Intention to enact a behavior*: the degree of intent to perform the behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed (see Table 1).

Mixing qualitative and quantitative approaches can produce a greater understanding of human behavior than using only one or the other (Creswell & Clark, 2007; Davis, Glikman, et al., 2019; Kelly et al., 2019). The quality and appropriateness of the survey tool (e.g., the framing and structure of questions) were evaluated through discussions involving behavior change experts independent of the research team (see Acknowledgments), and by piloting both the survey and sampling approach in communities surrounding the local research institution. All surveys were interviewer-administered and conducted in Bahasa Indonesia (the national language), with occasional use of Javanese (regional language) when necessary.

TABLE 1 Attitudinal questions measuring agreement to statements regarding wild birds, bird-keeping, and the environment and the psychographic questions based on the theory of planned behavior. Questions presented here all used 5-point Likert items to measure self-reported levels of agreement with presented statements from "strongly agree" to "strongly disagree." The format of the final question depended on whether the respondent owned or had ever owned a bird, or not

Statement	Topic/variable
Attitudes to:	
There are fewer birds in the wild now than when I was young	Wild birds
People shouldn't disturb wild birds their natural habitat	
Birds play an important role in the environment/ecosystem	
Birds remind me of my hometown/ village	
The state of wild bird populations is not a major concern to me	
Birds live longer in the cages than in the wild	Bird-keeping
Owning caged birds endangers birds in the wild	
The environment in Java is under threat (from pollution and climate change)	The environment
Potential predictors of behavior:	
I think keeping wild-caught birds is acceptable	Attitude
Friends and family close to me think keeping wild-caught birds is acceptable	Subjective norm
Friends and family close to me think you should keep wild-caught birds	Social norm
I am free to obtain wild-caught birds if you want to	Self-efficacy
I am able to access wild-caught birds easily	Perceived behavioral control
The next bird I obtain will be wild-caught/If I ever obtain a bird it will be wild-caught	Intention to keep wild-caught birds

2.2 | Data analysis

Demographic attributes and bird-ownership information, including whether any cage birds were globally threatened following the International Union for Conservation of Nature (IUCN, 2020), were summarized and examined using descriptive statistics to assess the representativeness of our sample. As is typical of survey-based studies, there were some questions that not all respondents were able to answer so sample size differed between analyses. After obtaining final categories for the reasons given by respondents for starting, stopping, or never keeping birds, differences in reported responses across different groups (e.g., bird-keepers and non-bird-keepers) were examined using Pearson's chi-squared tests. Although collected and synthesized using qualitative approaches, these responses were treated as quantitative data to explore the frequency of themes and categories. Where statistically significant differences were found, post hoc analyses determined which groups contributed significantly to overall trends. For analyses exploring differences across age groups, two groupings of ages were used, one for respondents' age at interview and one for their age when first keeping birds. As interviewees had to be over 18, but could start keeping

birds from any age, the distribution of ages in these categories could not follow the same pattern. We used Pearson's chi-square tests to examine differences across groups (age and bird-keeping user groups) in levels of agreement to the attitudinal questions, and post hoc analyses to determine which groups contributed to overall trends.

We fitted binary logistic mixed-effects regression models to identify important predictors of intention to obtain wild-caught birds incorporating aspects of the TPB and age of interviewee at the time of survey. We explored the attitudes of the bird-keeping user groups defined in Marshall et al. (2020a), namely Hobbyists (who keep birds primarily as pets), Contestants (who keep birds primarily for entry into contests), and Breeders (who keep birds primarily to breed or train). We fitted four global models to examine the effects and their significance across different groups regarding bird-ownership status: one for those who had never kept birds, one for those who currently or previously kept birds, one for Hobbyists, and one for Specialists (Contestants and Breeders combined). In all models, a random factor to account for the nested nature of data within the 92 communities was included (Bolker et al., 2009). Prior to inclusion in models, continuous variables were standardized and checked for collinearity, and predictors with high variance inflation factors (>2) were excluded (Zuur, Ieno, & Elphick, 2010). All analyses were performed in R version 3.6.1 (R Core Team, 2018), and all figures were created using the ggplot2 package.

3 | RESULTS

3.1 | The sample population

Of 3,040 household representatives surveyed, 957 (31%) were keeping birds when interviewed. Of the remainder, the majority (1,646, 79%) had never kept birds, whereas 437 (21%) had stopped keeping birds before the interview took place (dating as far back as 1980). Of bird-keeping respondents, 56% self-reported as Hobbyists, 26% as Contestants, and 17% as Breeders. Typically, Hobbyists owned the fewest birds per household (median, lower quartile–upper quartile [LQ–UQ]: 2, 1–4) and Breeders the most (7, 3–13). Hobbyists owned higher numbers of both wild-caught and threatened birds than the other groups, and were the least likely to consider the origin (wild-caught or captive-bred) when purchasing birds (Marshall et al., 2020b). Median ages (LQ–UQ) of non-bird-keeping and bird-keeping respondents were 41 (32–50) and 41 (33–51), respectively. Bird-keepers tended to have a high school education and to have been employed in business or clerical work; non-bird-keepers were more likely to have attained either a higher or lower level of education than high school, and to be unemployed (Marshall et al., 2020b).

3.2 | Primary reasons for never keeping birds

The most common reason for not keeping birds was lack of interest (46%), but lack of either skill, knowledge or patience (22%), and time (19%) to keep birds were also frequently cited (Table 2). Only 7% cited bird welfare or health/hygiene issues as disincentives, and even fewer (6%) cited lack of money. Proportions of reported reasons differed significantly across age groups with younger respondents more likely to cite lack of interest than other reasons ($\chi^2 = 15.6$, $df = 4$, $n = 1{,}474$, $p < .01$) and middle-aged respondents most often citing lack of time as the chief constraint ($\chi^2 = 23$, $df = 4$, $n = 1{,}474$, $p < .001$). Bird owners were more likely to own another non-avian pet than non-bird owners ($\chi^2 = 34.2$, $df = 1$, $n = 3{,}040$, $p < .01$).

3.3 | Primary reasons to start and stop keeping birds

The most common reasons given for starting to keep birds were to gain pleasure or entertainment from their song or appearance (28%), to keep up with peers or family members (23%), and simply to have a hobby (21%; Table 3). Proportions of reported reasons differed significantly across user groups, with Hobbyists more likely to have started by obtaining their birds opportunistically (as gifts or finding injured birds; $\chi^2 = 29.7$, $df = 2$, $n = 825$, $p < .001$), and Contestants and Breeders more likely to have started in order to earn money ($\chi^2 = 32.6$, $df = 2$, $n = 825$, $p < .001$). People who had started keeping birds as minors (<16 years) were more likely simply to want a hobby ($\chi^2 = 13$, $df = 3$, $n = 1{,}164$, $p < .01$) and to keep up with peers ($\chi^2 = 17.5$, $df = 3$, $n = 1{,}164$, $p < .001$); young adults (16–25 years) were previously unable to keep birds due to financial, temporal, or spatial limitations ($\chi^2 = 48.5$, $df = 3$, $n = 1{,}164$, $p < .001$); and older adults (>40 years) obtained birds opportunistically ($\chi^2 = 30.5$, $df = 3$, $n = 1{,}164$, $p < .001$; Table 3).

The reasons for stopping to keep birds were: inability to continue looking after them (38%); their death (24%); a need to sell or give them away (18%); their escape or theft (14%); loss of interest (4%); and feeling sorry for them (2%). The majority of bird-keepers gave up the hobby within 5 years of starting; and under-30-year-olds were the most likely to stop within 5 years ($\chi^2 = 26$, $df = 1$, $n = 104$, $p < .001$).

TABLE 2 Categories of reasons given for not keeping birds. Reasons that were cited by significantly different proportions of age groups are highlighted in bold, with significant differences between groups also highlighted in bold and marked with asterisks

		% age groups					
Rank	**Reason**	**<30, $n = 267$**	**31–40, $n = 442$**	**41–50, $n = 400$**	**51–60, $n = 253$**	**Over 60, $n = 112$**	**Overall (%)**
1	**Lack of interest**	**56***	45	44	40	43	677 (46)
2	**Lack of skill, knowledge, or patience**	20	22	18	25	30	317 (22)
3	**Lack of time**	14	19	**26***	20	**9***	281 (19)
4	Lack of money or space	5	7	6	6	8	93 (6)
5	Health or sanitary concerns	2	4	4	4	4	57 (4)
6	Welfare concerns	3	2	3	5	6	49 (3)

TABLE 3 Categories of reasons given for starting to keep birds. Reasons that were cited by significantly different proportions of user or age groups are highlighted in bold, with significant differences between groups also highlighted in bold and marked with asterisks

		% user groups			% age starting				
Rank	**Reason**	**Hobbyist, $n = 361$**	**Contestant, $n = 220$**	**Breeder, $n = 131$**	**Under 16, $n = 224$**	**16–25, $n = 263$**	**26–40, $n = 306$**	**Over 40, $n = 147$**	**Overall (%)**
1	To enjoy and appreciate song or appearance of bird	27	22	24	23	27	27	25	386 (28)
2	**To keep up with peers/ family**	18	22	23	**30***	17	22	20	318 (23)
3	**To have a hobby**	21	28	24	**31***	20	19	19	293 (21)
4	**Became able to do so (always interested)**[a]	17	15	15	**5***	**22***	13	**8***	141 (10)
5	**Opportunistically obtained (gift/found)**	**13***	1	2	**6***	**5***	11	**20***	139 (10)
6	**To earn money**	1	**9***	**11***	4	5	5	5	58 (4)
7	To add atmosphere	2	2	—	—	3	1	2	18 (1)
8	Impulse purchase	2	1	1	—	2	2	1	12 (1)
9	To protect from danger	1	—	—	—	—	—	1	3 (<1)

[a]Generally became able to afford to keep birds or space became available.

3.4 | Attitudes toward wild birds, bird-keeping, and the environment

Overall, non-bird-keepers and bird-keepers showed similar levels of agreement to the attitudinal statements, appreciating that people should not disturb birds in their natural habitat (93% vs. 94%, respectively), enjoying seeing birds in the wild (94% vs. 95%), and judging that there are fewer birds in the wild now than when they were young (90% vs. 88%). However, bird-keepers were more likely than non-bird-keepers to agree that "birds live longer in cages than in the wild" (33% vs. 21%, respectively; $\chi^2 = 98$, $df = 2$, $n = 2{,}384$, $p < .001$) but to disagree that "owning caged birds endangers birds in the wild" (48% vs. 62%; $\chi^2 = 43$, $df = 2$, $n = 2{,}401$, $p < .001$) and that "the state of wild bird populations is not a major concern to me" (59% vs. 64%; $\chi^2 = 10$, $df = 2$, $n = 2{,}418$, $p = .007$; Figure 1a). Similarly, non-bird-keepers and bird-keepers had different levels of agreement in attitudes toward the keeping and acquisition of wild-caught birds (Figure 1b). There were few differences in beliefs and attitudes toward bird-keeping across age groups, although older respondents were the least likely to agree that keeping birds endangers them in the wild (51% vs. ~60%; $\chi^2 = 19$, $df = 6$, $n = 2{,}390$, $p = .004$); and the oldest and youngest respondents were most likely to think that birds are an important part of the environment (85% vs. ~91%; $\chi^2 = 31$, $df = 6$, $n = 2{,}466$, $p < .001$; Figure 1c). Bird-owning user groups held similar attitudes toward wild birds and the keeping of wild-caught birds, but Hobbyists were the most likely to agree that "the state of wild bird populations is not a major concern to me" (64% vs. 48% Breeders, 55% Contestants; $\chi^2 = 17$, $df = 4$, $n = 819$, $p = .002$; Figure 1d).

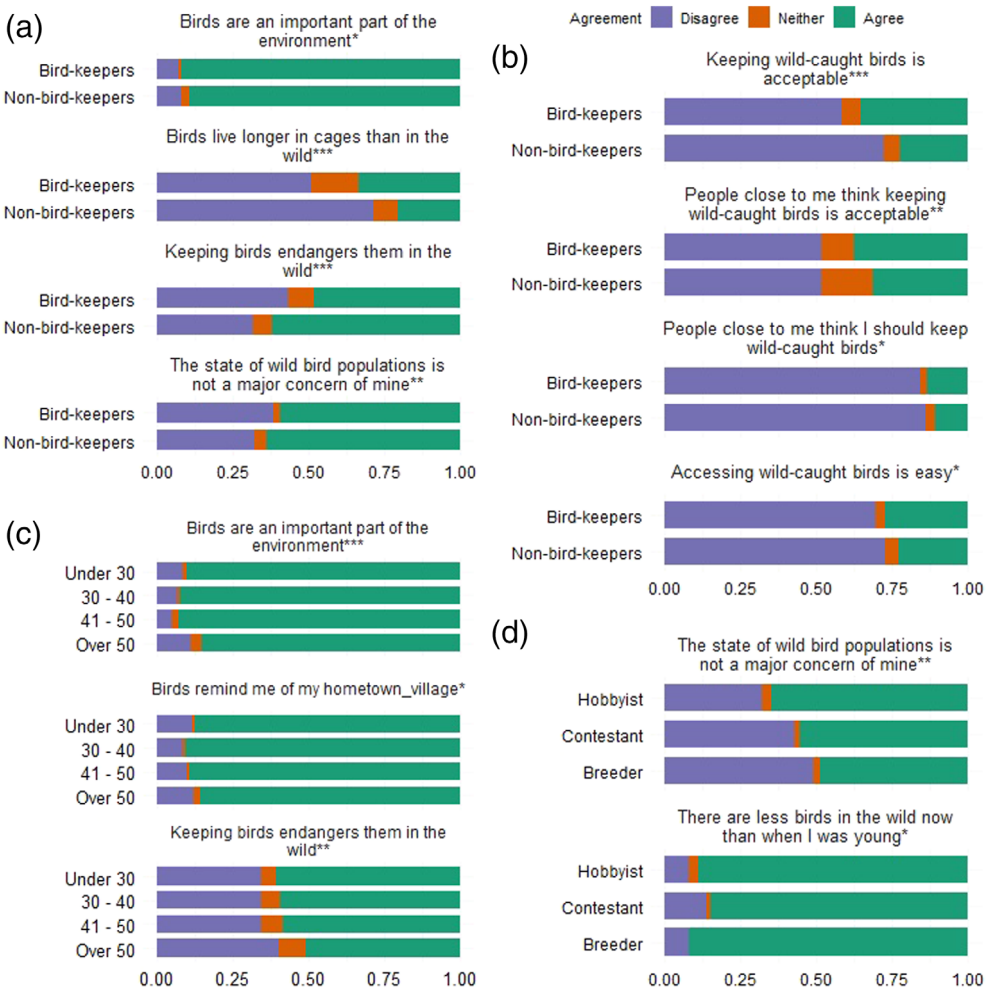

FIGURE 1 Attitudes of non-bird-keepers and bird-keepers toward (a) wild birds and (b) the keeping of wild-caught birds (based on the theory of planned behavior); and attitudes of (c) age groups and (d) bird-keeping user groups toward wild birds. Significance levels are coded as follows: *<.05; **<.01; ***<.001

TABLE 4 Percentages of groups that showed intention to obtain a wild-caught bird, with significance levels of psychographic and demographic predictors of said intention. All predictors showed a positive relationship with intention to obtain wild-caught birds; significance levels (*p* values) are coded as follows: *<.05; **<.01; ***<.001

	Non-bird-keepers	Bird-keepers[a]	Hobbyists	Specialists
Intention to obtain wild-caught birds	12%	18%	18%	17%
Predictor				
Attitude	0.77*** (0.19–4.14)	0.74*** (0.16–4.69)	0.64* (0.26–2.43)	1.21** (0.37–3.25)
Subjective norms	0.66** (0.19–3.46)	0.81*** (0.17–4.74)	1.32*** (0.29–4.47)	—
Social norms	—	0.51** (0.18–2.86)	—	1.02** (0.37–2.78)
Self-efficacy	0.92*** (0.17–5.57)	1.08*** (0.14–7.86)	1.18*** (0.24–5.00)	0.94** (0.29–3.22)
Perceived behavioral control	0.97*** (0.17–5.57)	—	—	—

[a]Includes previous and current keepers of birds.

3.5 | Drivers of intention to obtain wild-caught birds

Those who had never owned birds were unsurprisingly the least likely to state that the next bird they obtain would be wild-caught (12%), yet current and previous bird-keepers were only slightly more likely to do so (18%; Table 4). Among user groups, Breeders were the most likely to say that the next bird they obtain would be wild-caught (21%), followed by Hobbyists (18%) and Contestants (14%). In the logistic regressions predicting intention to obtain wild-caught birds across the different groups (Table 4), self-efficacy and attitude were strong predictors of intention to obtain a wild-caught bird across

all bird-keeping groups. Specialists were less likely to be constrained by the perception of others (subjective norms) toward obtaining wild-caught birds than Hobbyists, who were less likely to feel obliged to keep wild-caught birds due to social expectations (social norms) than Specialists (Table 4).

4 | DISCUSSION

Considering that the cultural and social context of consumer behavior can be crucial in determining and achieving success in behavior change efforts to reduce the overexploitation of wildlife (Dang Vu, Nielsen, & Jacobsen, 2020; Olmedo et al., 2018; Veríssimo & Wan, 2019). Our results suggest that widespread concern for animal welfare in the Global North (Challender & MacMillan, 2014; Dutton, Hepburn, & Macdonald, 2011) is not wholly shared by nonconsumers in Indonesia, as welfare was rarely cited as a reason for not keeping birds, providing further evidence to that of previous work, which together increasingly shows that these Western assumptions are just that—assumptions (Davis et al., 2016). Reasons for keeping birds differed across age and user groups, with Hobbyists and older people more likely to obtain them opportunistically, Contestants and Breeders for financial gain, and younger people simply to have a hobby, to keep up with peers, or because they became able to due to reduced financial, temporal, or spatial limitations. Despite the variety of reasons for starting, stopping, or never keeping birds, within groups of respondents in our study, the majority often recognized that wild birds were an important part of the environment, that they should not be disturbed in their natural habitat, and that there are fewer now than when they were young. This general concern for the conservation of wild birds provides a basis for identifying interventions to reduce the impact of the bird-keeping community on wild populations, as it highlights key points of contention and shared attitudes across heterogeneous stakeholder communities (Bennett et al., 2016; Jefferson et al., 2015).

A cultural backdrop of the long-term tradition of bird-keeping in Java in combination with a proportion of non-bird-keepers citing factors (lack of time or space) constraining their ability to keep birds, suggests that many non-bird-keepers might acquire them if these barriers were removed, or were to obtain them opportunistically (e.g., as gifts). Furthermore, the average price of commonly owned birds means that it is an accessible hobby to a significant proportion of the Indonesian population (Marshall et al., 2020a, 2020b), unlike other contexts where the price of traded wildlife gives those who consume or purchase it status (Thomas-Walters et al., 2021). Indeed, the low proportion of respondents citing costs as prohibitive suggests bird-keeping is perceived as a low-cost activity, which would help explain its ubiquity across Indonesia (Indraswari et al., 2020). In other examples where the consumption of wildlife is seen to be in part culturally motivated (e.g., wild meat in Vietnam: Shairp, Veríssimo, Fraser, Challender, & Macmillan, 2016), it has been shown that it could be possible to change social norms and customs through careful and thorough evidence-based campaigns, even when such the traditions that negatively impact on wild populations are widely practiced (Davis, Gibson, Lim, & Glikman, 2020; Davis, Glikman, et al., 2019; Davis, Willemsen, Dang, O'Connor, & Glikman, 2020). Although not primarily concerned about wild bird populations, non-bird-keepers tended to view bird-keeping as detrimental to such populations and were more likely to view it as unacceptable to keep wild-caught birds. Promoting social norms around non-bird-keeping by amplifying existing attitudes of non-bird-keepers (particularly the youngest and oldest) is thus important to slow recruitment into the bird-keeping community, playing on the fact that bird-keeping as currently practiced threatens wild bird populations, reducing their roles in ecosystem services (Iskandar et al., 2019), and raising awareness that trapping pressure is seriously affecting wild populations of species such as the ever-popular White-rumped Shama *Kittacincla malabarica* (Eaton et al., 2015).

At 18%, the proportion of all bird-keeping groups admitting an intention to obtain wild-caught birds in the future was lower than might be expected (Burivalova et al., 2017). However, these numbers are supported by previous research on Java that found that only around 27% of bird-keepers owned wild-caught birds (75% owned commercially bred birds) and around 15 to 22% stated a preference for wild-caught birds (Marshall et al., 2020b,). This said, the ubiquity of bird-ownership across Java (~12 million households; Marshall et al., 2020b) means that these proportions still represent a concerningly large number of households potentially procuring wild-caught birds in the near future. Our results suggested that social norms among bird-owners, such as peer pressure, increase intention, perhaps in accordance with other studies where ownership of wild-caught birds was clustered among socially similar communities or networks (Burivalova et al., 2017; Sánchez-Mercado et al., 2020). It may be that particular areas where the keeping of wild-caught birds is prevalent may be more resistant to demand-reduction efforts (Chausson et al., 2019; Wallen & Daut, 2017). Hobbyists often initially receive their birds opportunistically, commonly as gifts, thus altering the social acceptability of gifting wild-caught birds could therefore be a key tool in slowing recruitment into the Hobbyist user group, as has been attempted and sometimes achieved in other cases of wildlife

consumption (Dang Vu et al., 2020; Doughty et al., 2019). Breeders were the most likely to admit that their next bird would be wild-caught, despite their involvement in and awareness of the importance of the captive-breeding of songbirds, indicating the need for careful targeting of conservation messages in their direction; nevertheless, focusing efforts on reinforcing and establishing negative perceptions of obtaining wild-caught birds among younger bird-keepers will be vital to increasing the sustainability of the hobby.

A particularly sensitive issue that requires careful consideration and attracts much debate among conservationists is the use of captive-bred wildlife to replace demand for their wild counterparts. It has been demonstrated that the tradition of keeping birds as pets has deep cultural roots in Java and has become a very important part of current forms of identity across Indonesia (Jepson, 2008), which makes the possibility that bird-keeping in Indonesia will cease in the near future highly improbable. Finding ways to make bird-keeping more sustainable is thus a priority for songbird conservation. There is widespread capacity to breed birds in Indonesia due to the long history of bird-keeping in Indonesia (Hartono, 1990; Iskandar, Iskandar, Mulyanto, Alfian, & Partasasmita, 2020). Indeed, as observed in previous research, some of the most popular birds are those that are easier to breed than others (e.g., lovebirds *Agapornis spp*., canaries) and others are appearing in such high numbers that breeding capacity surely outstrips wild populations (e.g., Asian/Java pied starling *Gracupica* spp., White-rumped Shamas; Marshall et al., 2020a; Van Balen & Collar, 2021). Although there is a concern and in some cases evidence that breeding facilities launder birds, there is a strong argument that breeding birds such as lovebirds and canaries, that are not of conservation concern in Indonesia, to reduce demand for wild-caught natives should not be actively opposed (Jepson et al., 2011; Jepson & Ladle, 2009; Marshall et al., 2020a). Furthermore, as there is evidence that certain species of conservation concern are being bred in large numbers, support should be given to ensure these attempts are sustainable in their sourcing of breeding stock and practices. The promotion of the captive-breeding of popular but usually wild-caught species like Yellow-vented Bulbul *Pycnonotus goiavier* or leafbirds *Chloropsis* spp. is another avenue to follow.

Studies such as ours which deal with behaviors which are associated with illegal activity in some cases, need to be interpreted carefully (Davis, Crudge, et al., 2019). While we suggest that there was a correlation between what interviewees told us about the origins of their birds (discussed above) and ownership patterns from an independent study, there are likely to be some questions that were more sensitive than others. Future studies might utilize focus groups to investigate these issues, but evidence suggests fear of prosecution was minimal among our respondents and level of openness was surprisingly high. Notwithstanding such concerns, we believe this study provides a robust baseline assessment of the social and cultural context surrounding bird-keeping in Indonesia, which can steer future conservation research and efforts toward creating effective behavior change interventions. By combining qualitative and quantitative approaches, it profiles the motivations, attitudes, and perceptions toward bird-keeping among Java's people. Many people who do not currently own birds are still potential bird-keepers, so conservation campaigns need to extend beyond the bird-keeping fraternity to have an effect. Both demographic and behavioral profiles reveal differing reasons for keeping birds and attitudes toward wild birds and the environment, confirming the premise of the research that campaigns will be more likely to achieve results if they tailor messages and activities to specific groups. Campaigns could aim to reduce uptake among young non-bird-keepers, focusing on establishing norms around the unacceptability of keeping wild-caught birds. They could also seek to discourage the gifting of wild-caught birds to friends and family, instead redirecting demand through the promotion of sustainably sourced captive-bred alternatives or focusing on other culturally appropriate gift items. Research should monitor the efficacy and persuasiveness of such campaigns and identify the key media and stakeholders to involve. The formats of campaigns should maximize the engagement of the target communities, and thus the behavior change, awareness-raising, and education they hope to achieve.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

AUTHOR CONTRIBUTIONS

All authors played a role in designing the research. G.G. and H.M. carried out and coordinated data

collection. G.G. coordinated and led the coding of qualitative responses, and H.M. performed all statistical analyses. H.M. wrote the first draft of the paper with assistance from N.C. and S.M. All authors contributed to subsequent drafts of the paper.

ETHICS STATEMENT

Research teams gained permission from, and agreed to stipulations set by, the heads of neighborhood and relevant administrative authorities prior to data collection. Prior informed consent was always received verbally from respondents. Name of interviewer and time and date of survey were recorded before interviews; all data were anonymized upon collection. Participation was voluntary with no incentive or reward. We obtained ethical approval for our work from the Academic Ethics Committee from our research institution and the Ethical Review Committee at our collaborating research partner. A research permit (427/.A/SIP/FRP/E5/Dit.KI/II/2018) was granted by the Indonesian research authority (RISTEKDIKTI)) with Universitas Atma Jaya Yogyakarta as the named partner institution.

DATA AVAILABILITY STATEMENT

Fully anonymized data will be available from the Dryad Digital Repository: https://doi.org/10.5061/dryad.bnzs7h4bm.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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