

THE IMPACT OF NEGATIVE ENVIRONMENTAL FACTORS ON RECREATION CHOICE BEHAVIOR

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Abstract

In contrast to the amount of attention directed at examining the impact of recreation and tourism activity on the environment, very little research has explored the impact of the environment itself on recreation and tourism choice behavior. To address this gap in the research literature, a series of conjoint analysis experiments were conducted to examine how site selection decisions for selected outdoor recreation activities (golf, birdwatching, and fishing) would be affected by the negative environmental conditions often found in post-industrial urban areas (such as the Lake Calumet Region of Illinois/Indiana). This presentation reports results from data collected from samples of golfers and birders who evaluated conjoint profiles of hypothetical recreation sites described in terms of six study factors. Analysis of the study data provided insight into the relative importance of the factors across the two activity groups and among respondent subgroups that differed in terms of the level of activity specialization/ability. Taken together, the research findings contribute to our understanding of how environmental factors influence recreation choice behavior; and hold useful implications for those involved in managing and restoring natural resources and encouraging tourism visitation in post-industrial urban settings.

1.0 Introduction

The issue of how the environmental health/degradation of an area affects recreation usage and tourist visitation behavior is a critically important but sorely unexplored research topic. Prior research in recreation and tourism has examined the impact of environmental factors on preferences and choice behavior but primarily in the context of examining the impact of positive site or environmental features. For example, a study by Schroeder and Louviere (1999) examined how recreation usage would be affected by a variety of site features including the type of vegetation (i.e., whether grass and/or trees were present at the site), type of terrain (flat versus rolling hills), and the presence of water resources

(none, stream/pond, river, lake, etc.). Similarly, Perdue (1995) investigated preferences among information center users for site features such as shade trees, grassy areas, mountain views, lakes/ponds in the environment.

Studies that have examined negative environmental factors have focused predominately on perceptions of environmental impacts caused by either recreation use or tourism activity. For instance, several studies have examined perceptions of litter at campgrounds and other wilderness settings (e.g., Merriam and Smith 1974). A related stream of research, reviewed in Wall (1989), has looked at negative environmental factors arising from mechanized versus non-mechanized forms of recreation activity. For example, there have been several investigations of differences in the experiences sought and conflicts arising between groups such as snowmobilers and cross-country skiers (Jackson and Wong 1982); and canoeists versus power-boaters (Lucas 1964). The impact of tourism development and tourist activity on the environment has been a frequent topic in tourism texts (e.g., Fridgen 1991; Nickerson 1996; Williams 1994; Wyllie 2000) and the subject of a considerable amount of empirical research (reviewed in Ap and Crompton 1998; Mathieson and Wall 1990). For example, Wang and Miko (1997) examined the significance of environmental concerns – such as water quality problems, air quality problems, vegetation (flora) or wildlife (fauna) problems, and coastline/shoreline problems – associated with tourist activity at U.S. National Parks.

In contrast to the amount of attention paid to the impact of recreation and tourism on the environment, there have been only a handful of efforts devoted to exploring the impact of the environment itself on recreation and tourism choice behavior. One group of studies has demonstrated the negative impact that industrial/commercial activity can have on different recreation user groups, specifically birders (Cole and Scott 1999) and river users (Knopp et al. 1979; Robertson and Burdge 1993). Another group of studies has concentrated on examining the impact of a single environmental factor, air quality (i.e., visibility levels), on visitation to U.S. National Parks (Winger and McKean 1991; Schulze et al. 1983). One final study examined the impact of environmental factors in an international travel context.

This study conducted by Huybers and Bennett (2000) focused on potential overseas vacation travelers from the UK to Australia and examined the impact of environmental factors at a very general level of description – e.g., the condition of the environment was operationalized as ranging from unspoilt to very spoilt. In sum then, while environmental factors have been shown to be important, researchers have yet to fully examine how negative or degraded environmental factors, especially those that might be inherent in post-industrial landscapes, might impact recreation and travel decision making.

2.0 Study Objectives

The present study sought to address this gap in the research literature by examining how recreation site choice decisions for three selected recreation activities – golf, bird watching, and fishing – would be affected by the negative environmental conditions that are often found in post-industrial urban areas. Such areas, like the Lake Calumet Region of IL/IN, are common across the country and represent primary targets for both ecological and economic restoration. In addition to examining how the impact of these environmental factors varied for different recreation activities, a secondary objective was to examine differences in the impact of the factors for respondent subgroups that differed in terms of their level of activity specialization. The general expectation was that respondents that were highly specialized (e.g., serious birders) would be more tolerant of degraded environmental factors compared to those that were less specialized (casual birders). This paper reports results for two of the study activities, golf and birding; data for the third study activity, fishing, is still underway and will be reported at a later time.

3.0 Methodology

A self-administered conjoint analytic approach was used to explore these objectives. The factors and factor levels were selected based on the results of a literature review, in-depth interviews with recreationists, and consultation with recreation planners and resource managers. A total of six study factors, each defined at three levels were selected for the study (a listing of the specific factors and factor levels employed are given in Table 1).

A self-administered survey was developed consisting of four sections: (1) measures of golfing/birding behavior

Table 1.—Study Factors & Factor Levels

Travel time (by car):
15 minutes
45 minutes
90 minutes
Quality of birding (or golf) in the area:
Excellent
Good
Fair
Residential development:
No houses or residential development visible in the area
Some houses or residential development visible in the area
Heavy residential development visible in the area
Industrial activity:
No industrial activity visible in the area
Factory/industrial structures visible in the area
Landfill/waste treatment facility visible in the area
Air quality:
Good, no noticeable smells or odors in the air
Moderate, some noticeable manmade smells or odors in the air
Bad, strong/annoying manmade smells or odors in the air
Noise in the area:
Quiet, hear only natural sounds
Can hear some manmade or highway noises in the distance
Noisy, hear loud manmade or highway noises nearby

and interests; (2) conjoint ratings of hypothetical recreation sites described in terms of six study factors; (3) information on the types of environments typically experienced when golfing/birding; and (4) data on basic demographic characteristics. In order to minimize the number of profiles to be evaluated, and because the study factors were assumed to operate independently, a main-effects-only (fractional-factorial) design was employed. This design required respondents to evaluate only 18 profiles, rather than 729 profiles which would have been needed for a full-factorial (36) design. Respondents were instructed to imagine that they were planning an outing to go birding (or golfing) and to indicate how likely they would be to choose each option given the particular conditions described. A 9-point intentions scale was used for these ratings (where 1 was “extremely unlikely to choose” and 9 was “extremely likely to choose”). An example of the conjoint rating task and intentions scale is given in Figure 1.

SECTION 1

In this section are descriptions of options that might be available when selecting an area to go birding. We'd like you to imagine that you were planning an outing to go birding. For each option shown below, circle the number on the scale that best reflects how likely you would be to choose that option given the particular conditions described. Note that you should answer each based on your own personal desires, rather than the desires of the others that might bird or travel with you. (Circle one for each option)

Option #1	Travel time (by car)	90 minutes
	Quality of birding in the area	Good
	Residential development	No houses or residential development visible in the area
	Industrial activity	Factory/industrial structures visible in the area
	Air quality	Bad, strong/annoying manmade smells or odors in the air
	Noise in the area	Noisy, hear loud manmade or highway noises nearby
	Extremely UNLIKELY to choose	Extremely LIKELY to choose
	1 2 3 4 5 6 7 8 9	

Figure 1.—Example of the Conjoint Rating Task

Surveys were administered to a sample of 150 golfers at midwestern U.S. golf courses/practice centers via a drop-off and mail-back approach (which achieved a 40% response rate); and to 87 birders at meetings of midwest birding organizations using the same approach (for a 62% response). An additional sample of 728 birders was obtained using an online version of the survey posted on birding listservs. The data from the two birding groups were pooled, resulting in a total sample of 815 birders. Only those respondents that provided a complete set of conjoint ratings were retained for further analysis; this resulted in a total of 137 respondents in the golfer group and 736 in the birder group.

4.0 Findings

The data were analyzed using SPSS Conjoint 11.0. Inspection of the factor importance weights (given in Figs. 2 and 3 below) showed that golfers rated air quality/odors as most important (with a factor importance weight of 29.6), followed by travel time (22.8), activity

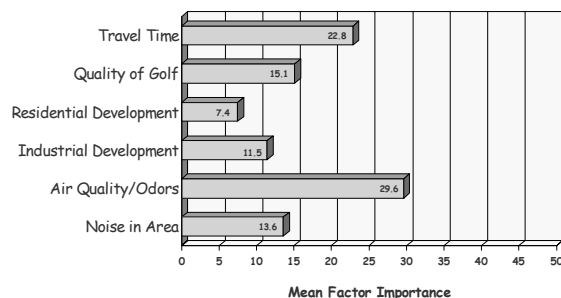


Figure 2.—Factor Importance Weights for Golfers (n=137)

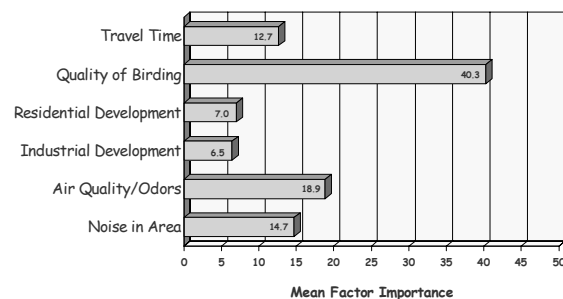


Figure 3.—Factor Importance Weights for Birders (n=736)

quality (15.1), noise (13.6), industrial development (11.5), and residential development (7.4). Birders, on the other hand, rated activity quality as most important (with a notably higher factor importance weight of 40.3), followed by air quality/odors (18.9), noise (14.7), travel time (12.7), residential development (7.0), and industrial development (6.5). Factor-level part-worth utility plots for the two activity groups (given in Fig. 4 below) show that preferences for the factors operated as would be expected – i.e., respondents in both groups had higher preferences for the more desirable factor levels (e.g., excellent birding quality) and lower preferences for levels that were less desirable (fair birding quality).

Subsequent analyses of the birding data were conducted to examine whether the conjoint ratings varied for respondents that differed in terms of their level of activity specialization. As a proxy for birding specialization, responses to a self-stated measure of the respondent's ability as a birder (i.e., "How would you rate yourself in terms of your ability to observe and identify birds?) was

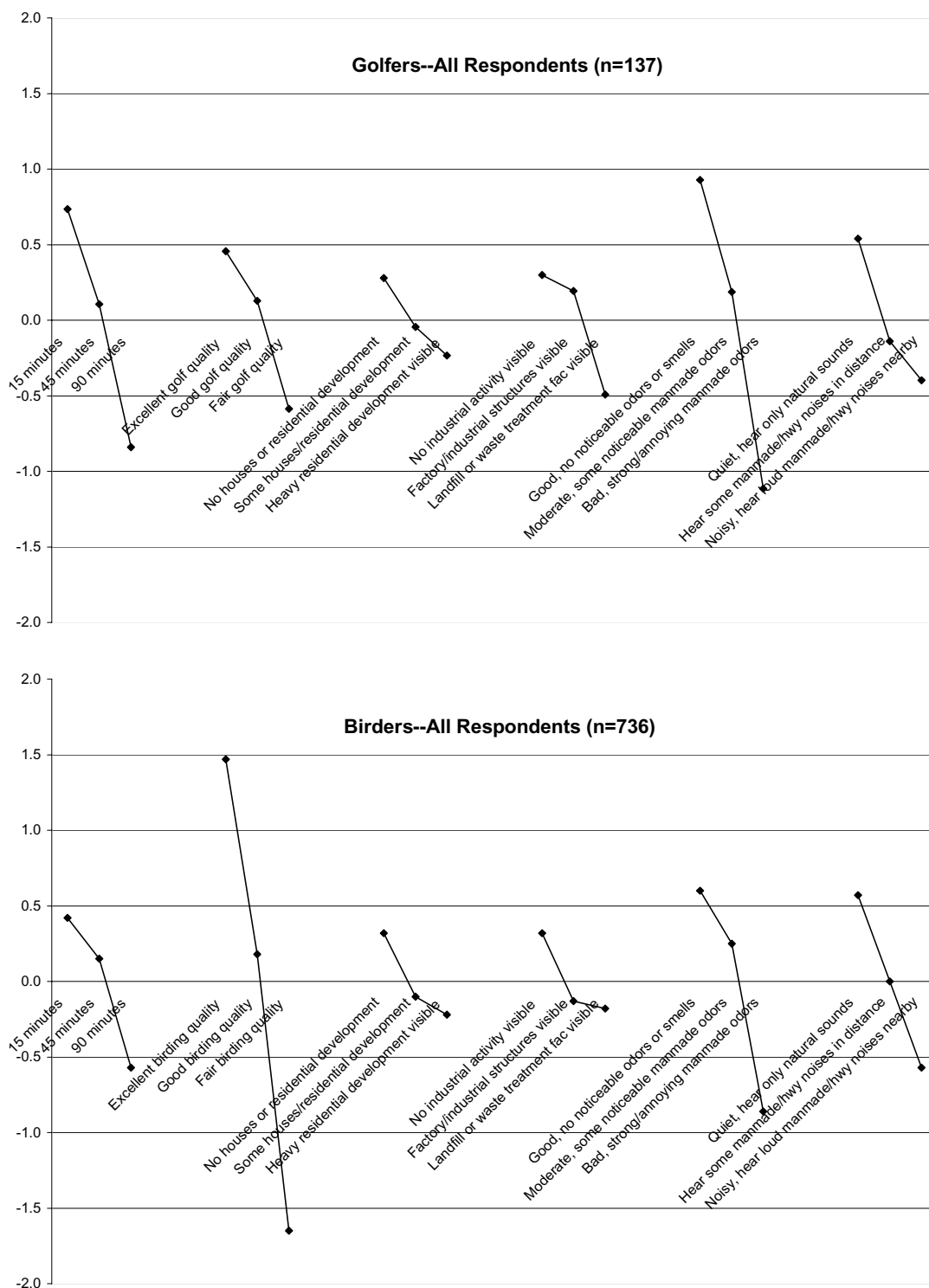


Figure 4.—Factor-Level Part-Worth Utility Plots for Golfers and Birders

used to classify respondents into one of four categories: beginner, intermediate, advanced, and expert. Data on the amount of money invested in birding-related equipment (mean replacement values) and frequency of

birding activity by ability subgroup (shown in Tables 2 and 3) indicated that the four groups differed in ways that were consistent with the recreation specialization concept.

Table 2.—Selected Birder-Activity Measures by Self-Stated Birding Ability

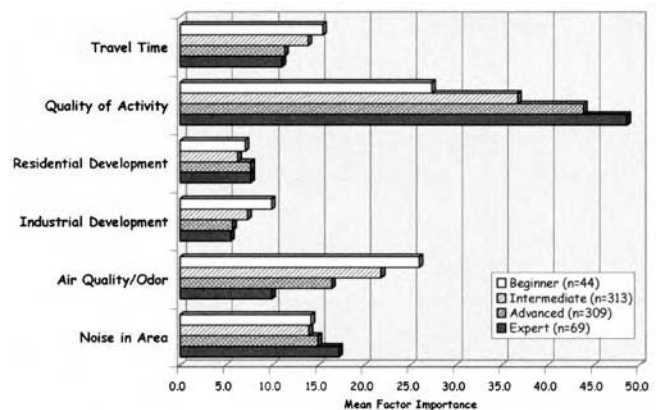
	Total (n=806)	Beginner (n=49)	Intermediate (n=336)	Advanced (n=341)	Expert (n=80)
Maintain a life list	75.7%	44.2%	67.1%	86.2%	87.7%
Mean # species on life list	657.4	137.1	425.1	763.9	1089.7
Maintain other list	59.4%	11.5%	51.9%	68.6%	81.5%
Using birding software	19.5%	3.8%	17.2%	23.5%	22.2%
Attend birding field trips	65.6%	50.0%	69.1%	67.8%	50.6%
Guide birding field trips	36.5%	1.9%	16.9%	53.2%	70.9%
Attend birding talks	68.9%	71.2%	65.9%	73.1%	62.0%
Lead/give birding talks	24.4%	3.8%	9.2%	33.6%	63.3%
Report rare bird sightings	53.3%	7.7%	35.9%	70.5%	83.5%
Participate in bird counts/surveys	76.9%	19.2%	68.8%	89.2%	96.2%
Participate in habitat conservation	63.0%	28.8%	55.8%	71.9%	77.2%

Table 3.—Investment in Equipment (Mean Replacement Value) & Birding Frequency by Self-Stated Birding Ability

	Total (n=806)	Beginner (n=49)	Intermediate (n=336)	Advanced (n=341)	Expert (n=80)
Mean RPV:					
Binoculars/scopes	\$1,672	\$ 519	\$1,359	\$1,934	\$2,604
Books/field guides	\$1,000	\$ 155	\$ 465	\$1,141	\$3,184
Cameras/lenses	\$1,005	\$ 988	\$ 763	\$1,041	\$1,875
Other equipment	\$ 148	\$ 85	\$ 89	\$ 173	\$ 332
Total all equip.	\$ 3,825	\$1,747	\$2,676	\$4,290	\$7,996
Mean Days Bird:					
In home state	78.3	32.6	64.9	95.3	91.0
In other states	12.9	3.7	9.8	15.8	19.4
Outside US	5.2	1.4	3.3	6.1	12.5

Analysis of the conjoint data by ability subgroup revealed interesting differences in the importance of the study factors (Fig. 5). For instance, the factor importance weights for the birder group showed that those that rated themselves as beginners were most concerned with birding quality and air quality/odors (which had factor importance weights of 27.4 and 26.0 respectively), followed by travel time (15.5), noise (14.2), industrial development (9.9), and residential development (7.1). In contrast, those classifying themselves as experts were concerned first and foremost with birding quality (which had a factor importance weight of 48.6) and then noise (17.2). Several respondents commented that they would go almost anywhere to see the right bird and that too much noise makes it difficult to identify birds by sound. The remaining study factors had less of an impact on

these respondents (travel time 11.0, air quality/odors 10.0, residential development 7.7, and industrial development 5.5).

**Figure 5.—Factor Importance Weights by Self-Rated Birding Ability**

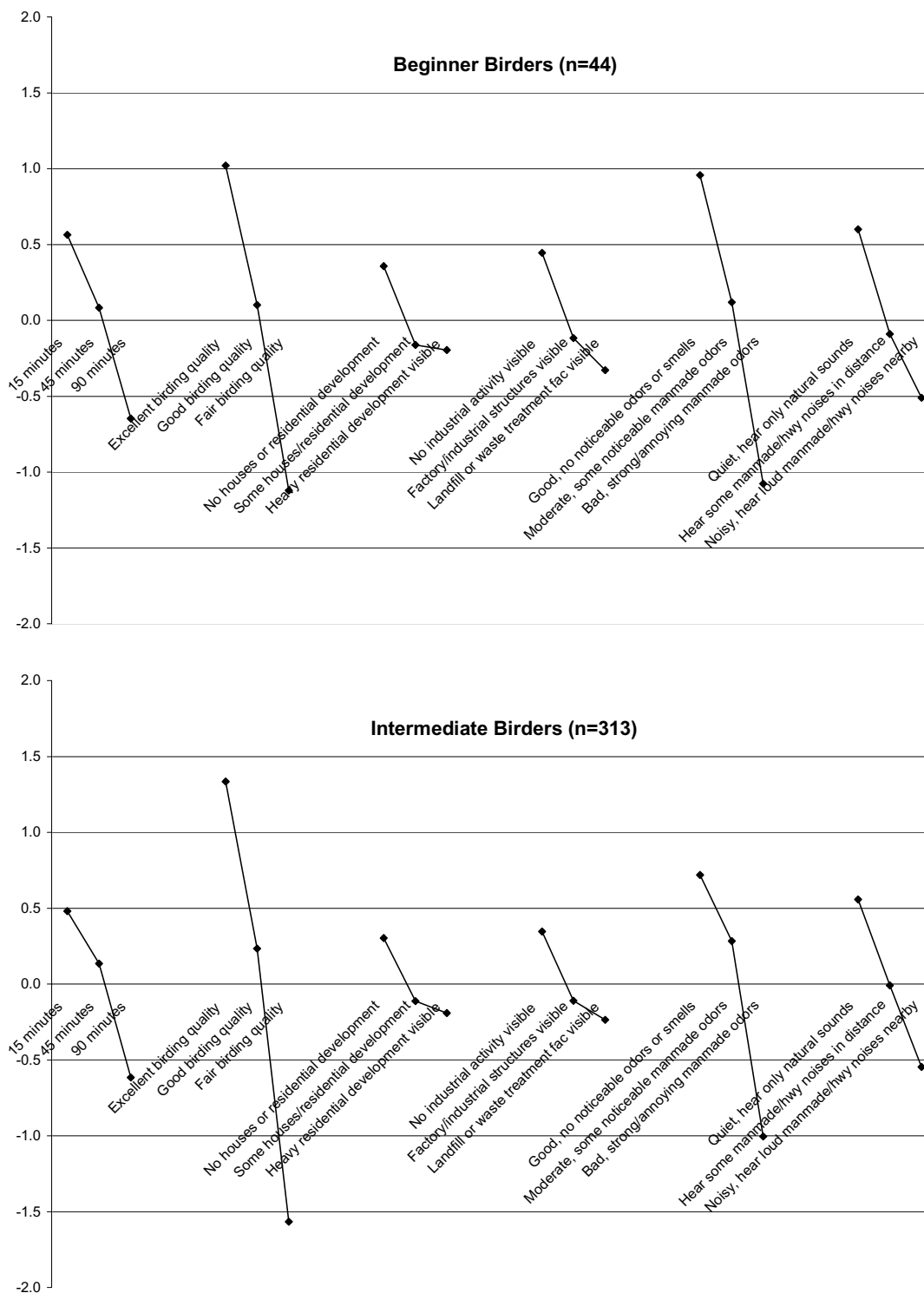


Figure 6.—Factor-Level Part-Worth Utility Plots for Beginner and Intermediate Birders

An inspection of the factor-level part-worth utility scores across the four subgroups (Figs. 6 & 7) revealed that preferences for the study factors generally operated as expected (i.e., all groups had higher preferences for more desirable factor levels and lower preferences for levels that were less desirable). The only exception involved

the utility values for the landfill/waste treatment plant level of the industrial activity factor. Specifically, the part-worth plots indicated that advanced and expert birders tended to rate this factor level more positively compared to respondents in the other two ability groups. This anomaly was explained, in part, by several of these

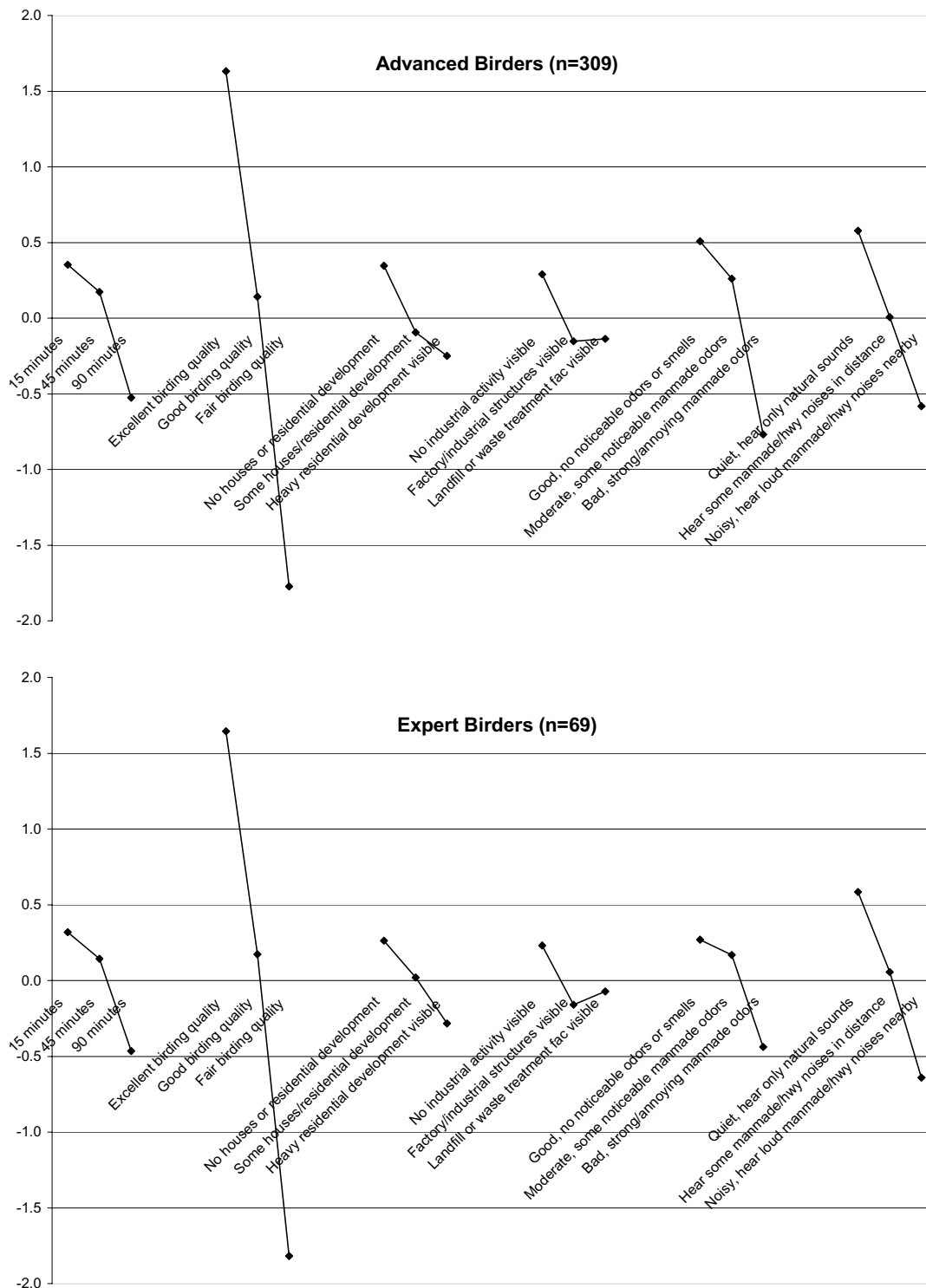


Figure 7.—Factor-Level Part-Worth Utility Plots for Advanced and Expert Birders

advanced/expert birders who noted that landfills and sewage treatment plants, since they typically attract a variety of bird species (and keep other recreation users away), often provide excellent birding opportunities.

5.0 Discussion

The results reported in this research showed that the impact of the study factors on recreation site selection decisions varied by activity and by level of

activity specialization or ability. In particular, as one's birding ability increased, the importance of the other environmental factors became secondary to the quality of birding in area. Interestingly, some of these factors became less important (or more tolerable) with increased birding ability (presence of factories/industrial structures, residential development, and air quality/odors in the air), while other factors became more important (less tolerable) with increased ability (noise in area). Taken together, these findings provide valuable insight into the impact that a negative or degraded environment can have on recreation site choice behavior; and thus should make a useful contribution to the recreation research literature.

In addition to their conceptual value, these results hold useful implications for those involved in managing and restoring natural resources in post-industrial urban settings. Restoring such areas for recreation use is critical to enhancing the quality of life of area residents and for rectifying, or at least addressing, resident concerns about environmental injustices that have occurred in the past. In addition to supporting the recreation interests of local residents, these areas hold considerable potential for attracting nature-oriented tourist visitation from outside the area. Continued research assessing the sensitivity of these outside resource users to the environmental conditions inherent in urban post-industrial areas should provide important insight to recreation planners and resource managers about the types of uses that would be sustainable, and thus should be encouraged and promoted in the future.

6.0 Acknowledgment

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