



FIGURE 8. IMPACT PERCEPTION RESPONSES ORDERED IN SUMMARY SCALE STRUCTURE.

by seeing too many other kayakers on the water each day, despite 67% noticing this impact. These results suggest that apart from congestion at campsites, negative social impacts were mainly due to perceived conflict with motorboat use.

When visitors did notice impacts, many were not bothered by them. This response could be considered ‘tolerance’ of the impacts. As noted above, few who noticed ‘too many other kayakers’ were bothered by it. Similarly, while 49% of kayakers noticed ‘over-development of campsites and their facilities’, only 5% were bothered by it. The remaining 44% noticed the impact, but were not bothered by it (e.g., indicating tolerance). It is clear from Figure 8 that many other impacts were noticed, but tolerated, including seeing too many camping, inadequate water supply and toilets, seeing big groups, noise from aircraft, wear at informal campsites, and all perceptions of over-development.

However, when most of those noticing an impact were bothered by it, it could be considered to show high ‘intolerance’ and unacceptability of the impact source. From Figure 8, impacts indicative of inappropriate behaviour by others appeared least acceptable to visitors (also see Figure 9). The main examples were related to seeing litter on the water/at beaches (noticed by 54% and bothering 42%), and at campsites (noticed by 51% and bothering 42%). Other examples include littering along the track, seeing toilet paper and waste, and wood cutting damage. These do appear to represent the least acceptable types of impacts, and the high proportions of kayakers apparently bothered by some of them emphasises litter as an important issue for management.

## 5.1 EFFECTS OF AGE, GENDER, NATIONALITY, AND CROWDING PERCEPTION

### 5.1.1 Background to analyses

Additional analyses were required to assess whether these impact perceptions varied significantly according to age group, gender, nationality and crowding perception. Figure 8 and Table 2 show the impact perception scales which were created for these analyses (refer Section 4.1.1).

TABLE 2. SUMMARY SCALES FOR SOCIAL AND PHYSICAL IMPACT PERCEPTIONS (REFER APPENDIX 2).

SCALES	DESCRIPTIONS
Physical impacts	Waste/toilet paper, vegetation damage, track trampling/damage, litter at huts, campsites, track and beaches, campsite wear
Hut congestion	Insufficient bunks, too many in huts, noise, rush for bunks
Over-development	Excessive level of huts, tracks, signs, campsites
Camp/social	Too many at camps/on track, noise, rush for campsites, big groups
Water/toilet/hygiene	Inadequate water supply/toilet facilities, water hygiene doubts
Boat disturbance	Disturbance by boats at huts, camps and on beaches, guided groups

### 5.1.2 Significant findings

Differences in these impact scales according to age-group (over and under 40 years), gender (male/female), nationality (New Zealand/overseas), and crowding perception (uncrowded/crowded) were analysed (refer Section 4.1 for method). The significant effects and interactions associated with the analysis using these independent variables are summarised in Table 3, where the mean values show that while the perceptions of impact were not high (means <2), some differences were apparent between the different groups. These results indicate that variations in perceptions of impacts related to campsites and water/toilet/hygiene conditions are particularly important for management attention.

TABLE 3. SIGNIFICANT EFFECTS ON IMPACT SCALES.

SOURCE OF SIGNIFICANT EFFECT*	SIGNIFICANT IMPACT SCALES†	MEAN VALUES (ADJUSTED)‡	
		Uncrowded	Crowded
Crowded effect F(6,161) = 2.18, p = .047	Camp/social congestion F(1166) = 5.43, p = .021	1.73	2.20
	Water/toilet/hygiene F(1,166) = 4.55, p = .034	1.96	2.28
Gender/age interaction F(6,161) = 2.15, p = .050	Over-development F(1166) = 9.35, p = .003	Male	Female
		Under 40 1.40	1.73
		Over 40 1.49	1.41

\* The significance of overall satisfaction effects was tested using the Wilks' criterion in the SPSS MANOVA.

† A series of univariate ANOVAs in the MANOVA identified the contribution of each satisfaction scale to the overall significant effect, and identified these listed scales as being significant.

‡ Mean values for the summary scales are divided by the number of constituent items to give a interpreted using the original question categories (e.g., 1 = Not noticed 2; = Not bothered; 3 = Bothered a little; 4 = Bothered a lot).

#### ***Crowded effect***

Kayakers who felt crowded had higher perceptions of impacts, particularly those related to camp/social congestion and water/toilet/hygiene conditions. Additional exploration of the camp/social congestion scale indicated that crowded kayakers also perceived greater levels of impacts from seeing too many kayakers on the water and other people at campsites. To a lesser extent, perceptions of seeing too many big groups also appeared greater among crowded kayakers. Additional exploration of the water/toilet/hygiene scale indicated that crowded visitors perceived greater inadequacy of water supply in particular. Perceptions of inadequate toilet facilities and uncertain water hygiene were generally more consistent between crowded and uncrowded kayakers.

#### ***Gender/age interaction***

A significant interaction between gender and age-group was based largely on kayakers' perceptions of over-development. Older males had the most negative perceptions of over-development, but these perceptions were lower among

older female kayakers. The perceptions of female kayakers remained largely consistent whether older or younger, and these were also consistent with the perceptions of younger male kayakers. Overall, this interaction distinguishes the more negative perceptions of older male kayakers. Additional exploration of the 'over-development' scale indicated that this effect was most apparent for perceptions of hut and sign over-development.

## 5.2 RELATING IMPACT PERCEPTION SCALES TO OVERALL TRIP EVALUATIONS

None of these impact scales were statistically associated with overall satisfaction, indicating that no specific social or physical impact perceptions were related to how the trip was evaluated. However, significant associations were found between impact perceptions and the overall crowding evaluation. An SPSS multiple regression ( $F(2,207) = 37.93$ , signif.  $F = .0000$ ) identified an association (adjusted  $r^2 = .261$ ) between the impact scales (independent) and crowding (dependent). The campsite/social congestion scale ( $\beta = .433$ ,  $t = 6.62$ ,  $p = .0000$ ) was the most important predictor of crowding. That is, being more bothered by the social impacts of campsite/social congestion was weakly associated with feeling more crowded. This interpretation was supported by the moderate correlations between crowding and the campsite/social congestion scale ( $r = .50$ ). The most important individual items correlated with crowding from the campsite/social congestion scale were 'seeing too many other kayakers during the day' ( $r = .46$ ), 'seeing too many at campsites' ( $r = .43$ ), and 'seeing too many big groups' ( $r = .33$ ). Other impacts correlated with crowding perceptions included 'motorboat disturbance at huts/campsites' ( $r = .39$ ) and 'motorboat disturbance on the water/at beaches' ( $r = .32$ ). Overall, the prominence of these individual items emphasises the importance of social congestion and conflict impacts to the crowding perceptions of kayakers

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