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Manicured, romantic, or wild?

The relation between need for structure and preferences for garden styles

Agnes E. van den Berg

Marijke van Winsum-Westra

*Wageningen University and Research Centre, The Netherlands*

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Direct correspondence regarding this paper to Agnes van den Berg, Wageningen University and Research Centre, PO Box 47, 6700 AA Wageningen, The Netherlands.

Email: [agnes.vandenberg@wur.nl](mailto:agnes.vandenberg@wur.nl)

## **Abstract**

The present research examined individual differences in preferences for three basic garden styles: manicured, romantic, and wild. Building on theoretical insights from landscape preference research, it was hypothesized that preferences for garden styles are guided by psychological needs. This hypothesis was empirically tested in two studies that used Personal Need for Structure (PNS; Neuberg and Newsom, 1993) as a predictor of preferences for allotment gardens in the Netherlands. In Study 1, 150 respondents rated the beauty of 30 photos of manicured, romantic, and wild allotment gardens. Results showed that respondents with a high PNS, as compared to respondents with a low PNS, rated wild gardens as less beautiful, and manicured gardens as more beautiful. Study 2 investigated the relationship between the PNS of allotment gardeners and the actual appearance of their gardens. 123 owners of allotment gardens filled out the PNS scale and classified their garden as manicured, romantic, or wild. Gardeners with a high PNS, as compared to gardeners with a low PNS, more often owned a manicured or romantic garden, and less often owned a wild garden. In both studies, preference for garden types was also related to demographic characteristics, including gender, education level, and age. The theoretical and practical implications of these findings are discussed.

Key words: Allotment gardens; Landscape preference; Nature experience; Personality; Visual quality.

## **Introduction**

In urbanized societies, gardens have become the primary place where people build their relationship with nature (Gross and Lane, 2007). The activity of tending a garden may contribute directly to people's emotional and physical health (Van den Berg and Custers, 2007). Moreover, gardens bring people in close contact with nature, which can motivate them to care for and protect the natural world (Schultz, 2000). In view of these considerations, it seems important to learn more about the factors which underlie people's appreciation of gardens.

People's appreciation of a garden is to a large extent determined by its visual appearance, which in turn is strongly influenced by the style of its design. There are many different garden styles, and most gardeners tend to spend much time and effort to create their own preferred garden style (Brookes, 1991). But what leads people to prefer one garden style over others? In the present research, we propose that this preference is shaped to an important degree by people's psychological needs, in particular, people's need for structure. In two empirical studies, we examined people's preferences for manicured, romantic, and wild garden styles. We hypothesized that preferences for manicured gardens would be positively related to need for structure, whereas preferences for wild gardens would be negatively related to need for structure.

In the following paragraphs, we first discuss characteristics of allotment gardens in the Netherlands, where the present study was conducted, along with a broad classification of garden styles. We then review previous empirical work on preferences for garden styles. Next, we present a theoretical framework that explains individual differences in preferences for garden styles from the ambivalent meanings of these styles which become apparent under different motivational orientations. We also consider need for structure as a potential indicator of these motivational orientations. Finally, we present and discuss two studies that examined empirical relationships between need for structure and visual and behavioural preferences for allotments gardens of different styles.

### *Allotment Gardens in The Netherlands*

Some decades after they were introduced in Great Britain, the first allotment gardens appeared in the Netherlands at the beginning of the nineteenth century when goodwill

organisations made plots of land available to poor urban labourers for the production of food (Irvine et al., 1999). Nowadays, the Netherlands has about 2000 allotment garden sites which serve a wide variety of purposes for diverse populations (CBS, 2009). Compared to other countries, there are many large sites with hundreds of plots which may encompass 20 hectares or more. Small homes are allowed on most of the larger sites, and many sites grant permission for overnight stay or even permanent habitation. Due to these amenities Dutch allotment sites often have the character of a bungalow park. In the past decades the population of community garden sites in the Netherlands has changed drastically from predominantly older males to a more mixed population including young urban families, artists, ecological gardeners, and immigrants (De Vries and Schöne, 2006). As a result, the appearance of Dutch allotment sites has become quite varied and many different garden styles can typically be found in one site.

### *Garden Styles*

Garden experts tend to distinguish between many different garden styles, most of which are linked to a specific time period, country of origin, or landscape architect (Turner, 2005). Nevertheless, there appear to be some broad categorizations that encompass almost any style (Miller, 1993). One of these categorizations is the distinction between formal and informal gardens. Formal gardens are characterized by their neat and manicured look, straight lines, and the regular rhythm of repeated plantings (Laird, 1992). Some well-known historical examples are the medieval cloister gardens and the French Renaissance gardens. Today, formal gardens can be minimalist with only a few elements, or more traditional, with a wider variety of orderly arranged plants and other features.

As the opposite of formal gardens, informal gardens have a more natural appearance. Within this category, a distinction can be made between romantic and naturalistic gardens (Kendle and Forbes, 1997). Some typical examples are the eighteenth century English landscape parks and the nineteenth century cottage and rose gardens. Naturalistic gardens involve a more wild aesthetic which allows the garden to grow to its full exuberance, or as some might call it, "to become overgrown". Historical examples include the wild gardens of the arts and crafts movement, which were planted with hardy exotic plants that would thrive without further care. In recent years, naturalistic gardening

has adopted a more ecological approach, which aims for sustainability and the inclusion of native rather than exotic plants (Gaston et al., 2007).

In sum, three basic types of gardens can be distinguished which represent a continuum ranging from formal to informal garden styles: manicured, romantic, and wild (see also Treib, 1999). Although this categorization may overlook more subtle similarities as well as differences between historically or regionally defined garden styles, it provides a suitable basis for studying general patterns in people's preferences for gardens and garden styles.

### *Preferences for Garden Styles*

Thus far, preferences for garden styles have mostly been studied from a historical perspective, with an emphasis on temporal variations in the popularity of styles. Only a few studies have empirically investigated contemporary preferences for different garden styles, mostly in the context of domestic gardens. These studies have revealed systematic variations that are related to individual background characteristics. For example, a survey among Arizona homeowners showed that lower-income homeowners, as compared to higher-income home-owners, were more than twice as likely to prefer pictures of a manicured lawn for the front yard relative to a wild desert (Larsen and Harlan, 2006). A study on the island of Tasmania indicated that gardeners with pro-environmental attitudes more often owned naturalistic local native and woodland gardens, and less often owned more manicured shrub and "gardenesque" gardens (Zagorski et al., 2004). Another more large-scale investigation in the same region revealed that households with a low income and education level, as well as the elderly, more frequently owned manicured garden types, such as exotic, shrub, and flower gardens, and less frequently owned wild garden types, such as native and woodland gardens (Kirkpatrick et al., 2007).

Taken together, empirical studies on contemporary garden preferences suggest that there exist systematic individual differences in visual and behavioural preferences that may be interpreted in terms of formal versus informal garden styles. However, because these studies used garden typologies that were not developed to represent formal and informal garden styles, the results remain open to different interpretations. Moreover, the available research has focused primarily on socio-demographic correlates of individual differences

in garden preferences, leaving the more psychological dimensions of these differences unspecified.

### *Theoretical Framework*

Within the broader field of environmental psychology, the psychological mechanisms underlying individual differences in preferences for natural settings have increasingly become the focus of theoretical and empirical efforts (Kaltenborn and Bjerke, 2002; Koole and Van den Berg, 2005; Özgüner and Kendle, 2006; Van den Berg and Koole, 2006; Jorgensen and Tylecote, 2007). Although this research has not directly focused on domestic or allotment gardens, the impact of this work goes beyond specific settings and the ideas and findings can be widely applied. Much of the research in this tradition has started from the observation that the perception and evaluation of natural settings is guided by two fundamental motives: the need to understand one's environment, and the need to explore and discover (Appleton, 1975; Kaplan and Kaplan, 1989). Thus far, these motives have been used mostly to explain consensus in landscape preferences, such as the observation that people across different ethnic groups and cultures seem to prefer pastoral settings with an optimal balance between possibilities for understanding and exploration (Heerwagen and Orians, 1993; Hagerhall, 2001). However, there is growing recognition that dual motive theories also provide a framework for understanding individual differences, in particular the finding that wild and manicured natural settings may evoke very different reactions in different people

In recent years, several studies have documented how the meaning of wild and manicured settings tends to vary depending on whether they are viewed from the perspective of understanding one's environment, or from the perspective of exploration (Koole and Van den Berg, 2005; Jorgensen and Tylecote, 2007; Ozguner et al., 2007; Konijnendijk, 2008). From the perspective of understanding, wild settings are imbued with a negative meaning, because they tend to lack structure and thus are difficult to understand. Manicured settings, on the other hand, are imbued with a positive meaning, because they are well-structured and easy to understand. From the perspective of exploring one's environment, the meanings of wild and manicured settings are reversed, because wild settings offer many opportunities to accommodate this need, whereas manicured settings have little to offer. Within this dual motive framework, individual differences in preferred

degree of human influence in natural settings can be explained because the needs for understanding and exploration may vary from person to person (Koole and Van den Berg, 2005; Van den Berg and Koole, 2006). Depending on genetic, cultural, personal, and situational factors, some individuals tend to be more oriented towards understanding, whereas others are more focused on the fulfilment of exploration needs. Consequently, meanings of wild and manicured nature, and resultant preferences, may vary across individuals depending on the relative strengths of the two motivational orientations.

### *Personal Need for Structure*

As yet, there are no reliable and valid measures of the needs for understanding and exploration available within the field of environmental psychology. This makes it difficult to put motivational accounts of individual differences in environmental preferences to the test. However, scales for measuring related concepts are available from other fields. One such concept is Personal Need for Structure (PNS, Neuberg and Newsom, 1993), a motive that is very similar to the need for understanding as described by Kaplan and Kaplan (1989). Like the need for understanding, PNS is theoretically defined as a general epistemic motive, i.e. a motive directed at the acquisition of knowledge. In general, individuals with a strong need for structure desire a quick answer and are aversive to ambiguity. They tend to use simple cognitive representations (e.g., schemata, scripts, stereotypes) to structure the world into a simplified, more manageable form (Neuberg and Newsom, 1993). Although the use of simple cognitive representations may sometimes lead to inaccurate conclusions and closed-mindedness, they enable people to be decisive in the face of endless possibilities.

Previous research by our own group provides some support for the importance of PNS to environmental preferences (Van den Berg, 2003). In three studies among various samples, we found that a high PNS was related to higher visual preferences for (a) gardens as compared to natural landscapes; (b) agrarian landscapes as compared to wilderness landscapes, and (c) traditionally managed as compared to ecologically managed urban nature. In this research, gardens were treated as one homogeneous category of manicured settings, no distinction was made between different garden styles. Thus, it remains to be tested whether PNS is related to preferences within the generally human-influenced category of gardens. Moreover, our prior research has focused only on

visual preferences, the possible impact of PNS on actual gardening practices has not been studied.

### *The Present Research and Hypotheses*

The aim of the present research was to study the relationship between PNS and preference for garden styles. We conducted two studies that were both situated in the context of allotment garden sites near large cities in the Netherlands. These sites are characterized by their mixed populations and many different garden styles can be found in one site. Apart from the variation in appearance, individual lots tend to be highly comparable in size, form, and layout. Consequently, allotment gardens provide excellent opportunities for studying individual differences in preferences for design styles while controlling for the influences of other garden characteristics.

In Study 1, we investigated the relationship between PNS and visual preferences for photos depicting manicured, romantic, and wild gardens. In Study 2, we investigated the relationship between PNS and garden owners' classifications of their own garden as manicured, romantic, or wild. We hypothesized that PNS would be positively related to a preference for manicured gardens, whereas it would be negatively related to a preference for wild gardens. Theoretically, these relationships can be explained by the fact that the information contained in a well-structured, manicured garden can be easily integrated in existing schemata and thus is easy to understand; the information contained in an unstructured, wild garden on the other hand cannot be so easily integrated in existing schemata and thus requires more effort to understand. PNS was expected to be unrelated to preferences for romantic gardens, presumably because the information in these intermediately structured settings does not serve as a perceptual cue for increased or decreased cognitive effort.

### **Study 1: Visual Preferences**

Study 1 consisted of an internet survey that asked respondents to rate the beauty of photos of allotment gardens that represented different styles.



Figure 1: *Examples of Photo's of Manicured (Top Row), Romantic (Middle Row), and Wild (Bottom Row) Gardens used in Study 1.*

## *Method*

*Respondents.* The sample consisted of a convenience sample of 150 adults from the Netherlands (73 males, 77 females) with a mean age of 43 years (range 23-79). About half of the respondents were employees of an environmental research institute in the Netherlands, the other half consisted of unidentified persons who visited the website of one of the authors. Because we were interested in finding relationships between two variables (need for structure and garden preferences) our objective was not to reach a representative sample, but rather a varied sample that would ensure sufficient variability in the variables of interest.

*Stimuli.* The stimuli consisted of colour photographs of allotment gardens taken with a digital camera by the authors during visits to sixteen different allotment sites in the Netherlands. From a total of about 1000 images, we selected 30 gardens that we considered typical examples of the three categories of manicured, romantic, and wild gardens (ten for each category). We took special care that the photos were comparable in photographic quality and perspective. We pilot-tested our classification by asking 40 respondents to classify each garden into one of three categories: (1) neat, straight, manicured; (2) lush, abundant, romantic; or (3) natural, wild, ecological. Based on this pilot-test we created a 'core set' of 24 gardens by selecting, for each garden category, the eight gardens that were assigned to this category by the highest percentages of respondents (see Fig. 1 for examples). Six gardens that were excluded from the core set were kept as fillers to make speculation about the purpose of the study more difficult. All photos depicted ornamental gardens; kitchen gardens were not included. All photos were taken in the spring season. None of the photos contained water features, cars, or people. However, because most photos were taken at allotment sites with facilities for overnight stay, it was inevitable that some of the photos (about 2-3 in each category) depicted houses.

*Measures and Procedure.* The survey was posted online during the months of July and August. Respondents could choose between a long and a short version. The short version was chosen by 59 respondents and took about 10 minutes to complete. In this version, visual preferences of respondents were measured by asking them to rate the 30 gardens on a 7-point scale ranging from 1 (ugly) to 7 (beautiful). The long version was chosen by

91 respondents and took about 25 minutes to complete. In this version respondents were asked to rate each garden on beauty and five other characteristics, including wildness (1 = manicured, 7 = wild). In both versions, the 30 photos were presented in the same random order at a size of 640x480dpi. Each photo was neutrally labelled with a number ranging from 1-30; rating scales were presented one by one on the right side of the screen next to the photo.

After the garden ratings, all respondents filled out an adapted six-item version of the PNS (Table 1) based on the German eight-item version (Wolfradt et al., 1999) of the original scale by Thompson, Naccarato and Parker (Thompson et al., 1989). Respondents were asked to indicate the degree to which they agreed with each statement on a 5-point scale (1 = strongly disagree; 5 = strongly agree). The scale showed sufficient reliability and variability, Cronbach’s alpha = .80,  $M = 2.76$ ,  $SD = 0.68$ . Finally, respondents answered questions on their age, gender, and education level.

Table 1:

*Shortened Personal Need for Structure Scale Based on the German Eight-Item Version (Wolfradt et al., 1999) of Neuberg and Newsom’s (1993) Original Scale ( Study 1 & 2).*

#	Item
1	It upsets me to go into a situation without knowing what I can expect from it.
3	I enjoy having a clear and structured mode of life.
6	I find that a well-ordered life with regular hours makes my life tedious, <i>reverse-scored</i> )
7	I don’t like situations that are uncertain.
9	I hate to be with people who are unpredictable.
12	I become uncomfortable when the rules in a situation are not clear

Note. Numbers refer to original scale items. Of the eight item version of Wolfradt et al, 1999, only items with factor loadings > .40 were included.

*Statistical Analysis.* All statistical analyses were performed using SPSS, version 15.0. Differences in wildness and beauty ratings between garden categories were assessed from post-hoc pairwise comparisons using a multivariate analysis of variance (MANOVA) with repeated measures. The median split procedure was used to classify respondents into a group with a high PNS (N = 72) and a group with a low PNS (N = 78). Relationships between PNS and preferences for garden styles were tested by subjecting respondents' beauty ratings for the three garden categories to a repeated measures MANOVA with PNS (High vs. Low) as the independent variable and education level, gender, and age as covariates. Relationships between PNS and socio-demographic characteristics were conducted in a similar manner, with one of the three characteristics (education level, gender, age) as the (dichotomous) independent variable, and PNS and the other two socio-demographic variables as covariates. In the case of significant interactions, post-hoc tests of between-group differences for each garden category were conducted.

Table 2:

*Mean Wildness and Beauty Ratings (Range 1-7) and Standard Deviations (Between Brackets) of Manicured, Romantic, and Wild Allotment Gardens in Study 1.*

	<i>Garden Style</i>			<i>Main Effect Garden Type</i>	
	Manicured	Romantic	Wild	<i>F</i>	<i>p</i>
<i>Wildness (n = 91)</i>	1.76 (0.49)	2.82 (0.72)	5.89 (0.69)	1237.61	<.001
<i>Beauty (n = 150)</i>	3.04 (1.00)	4.87 (0.73)	4.06 (1.21)	126.74	<.001

*Note.* All pairwise differences in wildness and beauty ratings between the three garden categories are significant at  $p < .001$ .

## Results

*Manipulation Check.* Respondents' ratings of wildness were consistent with our a-priori classification of the gardens. As can be seen in Table 2, the ten manicured gardens were generally rated as manicured, whereas the ten wild gardens were generally rated as wild. The ten romantic gardens were rated at intermediate (but relatively manicured) levels..

*Perceived Beauty of Garden Types.* Table 2 shows that romantic gardens were generally rated as most beautiful, followed by wild gardens. Manicured gardens were rated as least beautiful. In line with our theoretical analysis, there was more individual variation ( $SDs \geq 1$ ) in beauty ratings of wild and manicured gardens than in beauty ratings of romantic gardens ( $SD < 1$ ).

Table 3:

*Means and Standard Deviations (Between Brackets) of Beauty Ratings (Range 1-7) of Manicured, Romantic, and Wild Allotment Gardens as a Function of Personal Need for Structure (PNS), Gender, Education Level, and Age (N =150 , Study 1).*

	Garden Style			Interaction Effect	
	Manicured	Romantic	Wild	F	p
<i>PNS</i>				14.51	<.001
Low (n = 78)	<b>2.78</b> (0.93)	4.86 (0.68)	<b>4.40</b> (1.15)		
High (n = 72)	<b>3.33</b> (0.99)	4.89 (0.78)	<b>3.69</b> (1.16)		
<i>Education Level</i>				3.92	<.05
Academic (n = 127)	<b>2.95</b> (0.94)	4.82 (0.71)	4.11 (1.18)		
Non-academic (n = 23)	<b>3.57</b> (1.14)	5.19 (0.78)	3.78 (1.35)		
<i>Gender</i>				1.48	ns
Men (n = 73)	2.95 (0.91)	<b>4.63</b> (0.68)	<b>3.89</b> (1.18)		
Women (n = 77)	3.12 (1.06)	<b>5.10</b> (0.71)	<b>4.23</b> (1.22)		
<i>Age</i>				0.30	ns
≤ 43 years (n = 78)	2.95 (1.03)	4.81 (0.76)	4.08 (1.17)		
> 43 years (n = 72)	3.14 (0.95)	4.94 (0.68)	4.03 (1.26)		

*Note.* Data are displayed as 'raw', unadjusted means. Test results are based on adjusted means. Means printed in boldface differ significantly between two groups of the independent variable within a garden category at  $p < .05$ .

*PNS and Garden Preferences.* As can be seen in Table 3, participants high on PNS, as compared to participants low on PNS, gave higher beauty ratings to manicured gardens, and lower beauty ratings to wild gardens. PNS was not related to the perceived beauty of romantic gardens.

*Demographic Characteristics and Garden Preferences.* Table 3 also shows that there were significant differences in beauty ratings as a function of education level and gender (controlled for PNS). Education level interacted significantly with garden type, so that respondents with an academic education rated manicured gardens as less beautiful, and wild gardens as somewhat more beautiful, than non-academic respondents. Women generally gave higher beauty ratings to all garden types than did men. Although the influence of gender was significant only for romantic and wild gardens (and not for manicured gardens), the overall interaction effect between gender and garden type was not significant. This suggests that the influences of gender reflect women's higher appreciation of gardens in general, than a higher appreciation of specific garden types. Age was not related to beauty ratings of any of the three garden categories.

### *Discussion*

As predicted, individuals with a high need for structure rated manicured gardens as more beautiful, and wild gardens as less beautiful, than did individuals with a low need for structure. These findings are consistent with the notion that preferences for gardens are shaped to an important degree by people's psychological needs.

A remarkable finding of Study 1 is that the gardens were not rated as very beautiful; even the ratings for the most preferred romantic garden category were not far above the midpoint of the scale. This finding seems at odds with the many studies that have reported a strong preference for natural settings, which has been interpreted as evidence for a 'biophilia', or innate tendency to love nature (Ulrich, 1993; Joye, 2007). However, it is consistent with findings of previous research (Van den Berg et al., 2003), in which we found that gardens were generally rated less beautiful than large-scale natural landscapes. A weak visual preference for gardens could therefore be typical for modern Western societies, in which large-scale natural areas tend to be perceived as more exceptional and precious than tamed nature. It is also possible, however, that the relatively low beauty

ratings reflect other factors related to the quality of the photos, the specific composition of the sample, or the use of allotment gardens as stimuli.

## **Study 2: Garden Appearance**

In Study 1 we found a relationship between PNS and visual preferences for gardens. However, there may be a discrepancy between which garden type a person prefers aesthetically, and which type of garden he or she actually owns (Larsen and Harlan, 2006). Such a discrepancy may be explained by the fact that actual gardening behaviours are influenced by many practical and contextual factors besides personal and aesthetic considerations, including issues of appropriateness, status, maintenance, play opportunities for children, and copying of neighbour gardens (Zmyslony and Gagnon, 1998). Consequently, we conducted a second study in which we tested for a relationship between PNS and the actual appearance of people's own allotment gardens.

### *Method*

*Respondents.* The sample consisted of 123 Dutch allotment gardeners (67 males, 56 females) with a mean age of 59 years (range 32-87). The sample was drawn from members of 12 large allotment garden sites in the Netherlands. These 12 allotment sites formed a subset of the 16 sites that were previously visited and photographed by the authors. Respondents were invited to participate by means of a notice in the newsletter of their allotment organisation.

*Procedure and Questionnaire.* The study was conducted as part of the 'Vitamin G' program on health benefits of green space (Groenewegen et al., 2006). For the purpose of the current research, questions on the appearance of one's garden and the need for structure were embedded in a survey on the life style of allotment gardeners. Gardeners were asked to indicate which description fitted best with the appearance of their own garden: (1) neat, straight, manicured; (2) lush, abundant, romantic; or (3) natural, wild, ecological. Need for structure was measured by the 6-item PNS. The scale showed sufficient reliability and variability, Cronbach's alpha = 0.85,  $M = 3.27$ ,  $SD = 0.79$ . Apart from questions on garden purpose (ornamental vs. kitchen) and demographics such as age, gender and education level, the other questions in the survey were irrelevant to the current research and will not be discussed.

Respondents could choose between an online version of the survey (94 respondents) or a paper-and-pencil version (29 respondents) that could be obtained from the allotment organization. Data collection lasted from February to April. As an incentive, we offered respondents a chance to win a lottery ticket of 12.50 Euro.

*Statistical Analysis.* Data analysis was conducted in two steps. As a first, preliminary step, we applied a simple cross-tabs procedure to estimate differences in frequencies of gardens between groups with a high and low PNS (based on median split). As a second step, we conducted a multinomial logistic regression analysis to determine if PNS remains significantly related to garden type after controlling for socio-demographic variables. Adjusted odds ratios were calculated for three separate contrasts (1) manicured versus wild; (2) romantic versus wild; and (3) manicured versus romantic. These odds ratios present the exponent of the beta weights for each predictor. An odds ratio of 1.0 means that, controlling for other variables in the equation, the predictor has no effect (even odds). Coefficients greater than 1.0 indicate a positive effect on (or increase in the odds of) having one garden type as compared to another; coefficients less than 1.0 indicate a negative effect on (or decrease in the odds of) having one garden type as compared to another.

*Frequencies of Garden Types and Need for Structure.* The sample included 50 kitchen gardens and 73 ornamental gardens. Although the romantic style was less typical for kitchen gardens than for ornamental gardens, there was substantial variation in garden types within both garden categories (cf. Fig. 2). Of all the gardens, 39% were classified as ‘neat, straight, manicured’, 37% as ‘natural, wild, ecological’, and 24% as ‘lush, abundant, romantic’. As shown in Fig. 2, gardeners with a high PNS more often classified their garden as manicured, and less often classified their garden as wild, than did gardeners with a low PNS. They also more often classified their garden as romantic. These differences were found for ornamental gardens as well as for kitchen gardens.

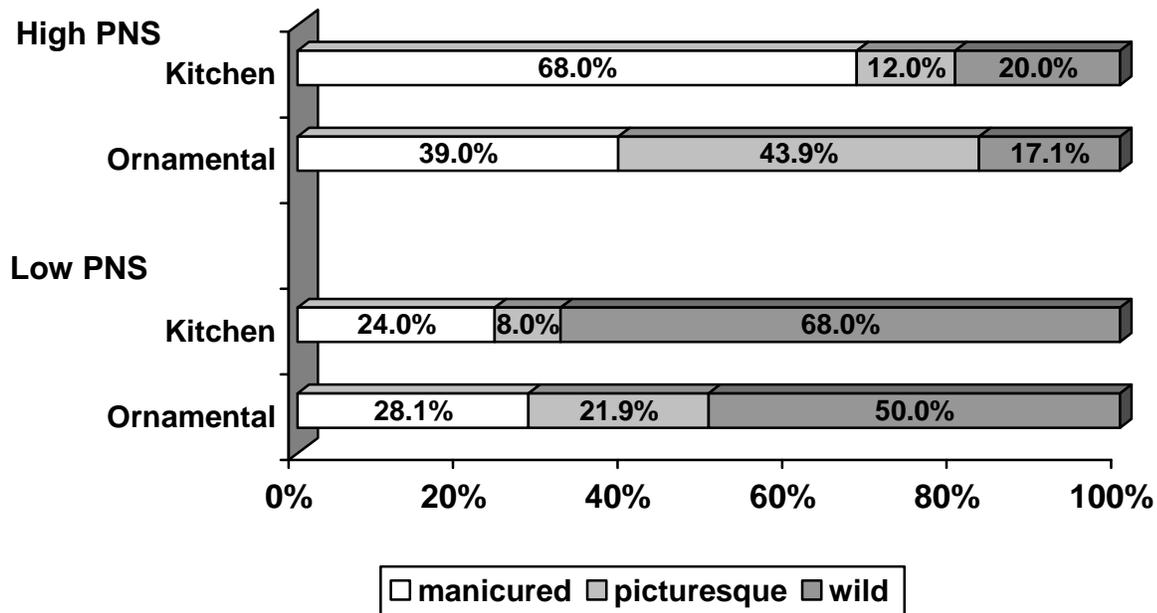


Figure 2: Frequency Distribution of Garden Types as a Function of Garden Purpose (Kitchen vs. Ornamental) and Personal Need for Structure (PNS; Study 2).

*Multinomial Regression Analysis.* Table 4 shows that PNS was significantly related to the odds of having a manicured or romantic as compared to a wild garden type. When other variables are held constant, respondents with a high PNS are 3.25 more likely than respondents with a low PNS to have a manicured as compared to a wild garden, and 6.11 times more likely to have romantic as compared to a wild garden. Need for structure did not influence the odds of having a romantic versus a manicured garden.

The analysis also revealed significant influences of gender, age, and garden purpose (kitchen vs. ornamental), independent of need for structure. Men were 2.93 times more likely than women to own a manicured as compared to a wild garden. Age was negatively related to having a romantic versus a manicured garden; the odds of having a romantic compared to a manicured type decreased by 6% with each increasing year of age. As noted before, owners of kitchen gardens were more likely to have a manicured or a wild garden compared to a romantic garden

Table 4:

*Odd Ratios of the Coefficients of Multinomial Logistic Regression of Garden Types on Gardener Characteristics (N = 123; Study 2).*

Predictors	<i>Manicured/</i>	<i>Picturesque/</i>	<i>Manicured/</i>
	<i>Wild</i>	<i>Wild</i>	<i>Picturesque</i>
	<i>Exp (β)</i>	<i>Exp (β)</i>	<i>Exp (β)</i>
High (vs. low) PNS	3.25*	6.11**	.53
Male (vs. Female)	2.93*	1.46	.50
Lower (vs. higher) education	1.98	2.35	.84
Age	1.02	.96	1.06*
Kitchen (vs. ornamental) garden	1.33	.28*	4.80*
<i>Log likelihood</i>	-46.33		
<i>Nagelkerke's R<sup>2</sup></i>	.355		
<i>Df</i>	10		

*p* < .05. \*\* *p* < .01.

### *Discussion*

The results of Study 2 provide further support for a relationship between PNS and preference for garden types. As expected, gardeners with a high PNS were more likely to have a manicured garden as compared to a wild garden. They were also more likely to have a romantic as compared to a wild garden. This latter finding was unexpected, but is consistent with the finding of Study 1 that romantic gardens are perceived as relatively manicured. PNS did not differentiate between owners of romantic and manicured gardens.

A limitation of Study 2 is that garden types were measured in terms of respondents' own classifications, and not by means of objective ratings by independent observers. Previous research has shown that some people have, for example, smaller conceptions of

wilderness than others (Lutz et al., 1999). Consequently, the results may reflect conceptual differences rather than differences in the actual appearance of gardens. To obtain an indication of the validity of the gardeners' classifications of their garden, we compared these classifications with our own impressions of the overall atmosphere and appearance of the sites in terms of manicured, romantic, or wild. Only for two out of twelve sites, our own classification did not match with the most frequent classification as provided by the gardeners, which equals an "interobserver reliability" of 83%. Thus, we do not deem it likely that interpretational differences in the classification of gardens formed a major threat to the validity of the research.

### **General Discussion**

In two studies, we investigated the influence of personal need for structure (PNS) on preferences for manicured, romantic, and wild allotment gardens. The first study showed that PNS was positively related to the perceived beauty of manicured allotment gardens, and negatively related to the perceived beauty of wild allotment gardens. The second study showed that allotment gardeners with a high PNS, as compared to gardeners with a low PNS, more often classified their own garden as manicured or romantic, and less often classified their garden as wild. Taken together, these findings lend support to the notion that individual differences in preferences for garden styles are guided by fundamental psychological needs (Koole and Van den Berg, 2005).

The current research also sheds some light on other variables besides need for structure that may influence individual variation in preferences for garden types. Consistent with previous research (Van den Berg and Koole, 2006; Kirkpatrick et al., 2007), a higher education level was found to be related to a lower aesthetic appreciation of more human-influenced (manicured and romantic) gardens; however, there were no indications for an influence of education level on actual gardening practices. In both studies, gender was found to be an important influence on preferences. Men were generally less appreciative of gardens than women, in particular wild or romantic gardens, and they more often owned a manicured garden as compared to a wild garden. These findings may reflect a greater male desire to have control over nature (Gross and Lane, 2007). This desire may be specific for gardens and other land that is privately owned, because thus far gender has not been found to play an important role in preferences for public parks and landscapes.

Romantic gardens were less frequent among the elderly, perhaps because of their labour intensiveness which can pose problems with increasing age. Romantic gardens were also less frequent among owners of kitchen gardens, probably because this type is less suitable for kitchen gardens. Taken, together these findings suggest that, besides psychological needs, demographic, cultural, and practical factors play an important role in preferences for garden type and should be considered in more depth in future research.

By conducting two studies that employed different methodologies, the current research provides convergent evidence for an influence of need for structure on preference. However, there were also some differences in the findings of the two studies that are difficult to interpret. Most importantly, romantic gardens were less preferred in Study 2 than in Study 1. This difference may reflect differences in sample composition, such as the fact that respondents in Study 2 were generally older and lower educated than respondents in Study 1. However, the lower preference for romantic gardens in Study 2 could also be related to the use of a behavioural outcome measure. Romantic gardens are generally known as a labour-intensive and time-consuming garden type. Therefore, this garden type may not have been practically feasible for many gardeners, encouraging them to adopt a more realistic, but also more controversial, wild or manicured type. In the absence of a “shared idealized image” individual differences may have become more pronounced (Hagerhall, 2001). If this latter interpretation is valid, then our research suggests that studying people’s own gardens offers a promising venue for expanding and deepening the understanding of individual variation in landscape preference.

#### *Limitations and Future Perspectives*

In the present research garden styles were studied in the context of Dutch allotment gardens. This may have limited the generalizability of the results to other countries and to other types of domestic or public gardens. Even though allotment sites in the Netherlands have adopted a more open-minded regime, they still represent a relatively controlled world in which certain styles, in particular more manicured styles, may be more common than in other domains. This may have lead to inflated estimates of the relationship between garden styles and need for structure. However, it seems unlikely that our findings are unique to allotment gardens in the Netherlands. We used a broad categorization of garden styles based on international trends and examples. Moreover, our

categorization is consistent with current insights into the major dimensions underlying people's perception of natural settings (Özgüner and Kendle, 2006). This suggests that our methods and results are widely applicable to any kind of gardens or natural settings. Nevertheless, it is important for future research to replicate the results of the current study in different countries, with different types of gardens and with different groups of respondents.

The current research treated PNS as a personality trait. However, PNS may not only vary across persons, but also across situations (Kruglanski, 1989). Some situations, such as situations involving time pressure or emergency, may enhance PNS, and thus, temporarily increase the preferred degree of order and human influence in natural settings. By examining effects of situationally induced changes in PNS future research may provide more insight into the possible causal nature of the relationship between PNS and preferences for garden styles.

Another limitation of the current research is that it focused one-sidedly on 'the understanding side' of nature experience. However, according to leading theories, human responses to natural settings are not only guided by a need for understanding (or structure), but also by a need for exploration (Appleton, 1975; Kaplan and Kaplan, 1989). It would be informative to simultaneously study the influence of both these needs in future research on preferences for garden types. To obtain valid measures of these needs, future research might draw upon motivational theories of self-regulation, such as regulatory focus theory (Higgins, 1997), which makes a distinction between a prevention focus (i.e., a focus on avoiding negative outcomes) vs. a promotion focus (i.e., a focus on obtaining positive outcomes) that bears close resemblance to the distinction between the need for understanding vs. exploration. In a similar vein, the theory of Personality Systems Interaction (Kooze and Kuhl, 2003) makes a distinction between state vs. action orientation that also appears highly relevant. Thus, it seems that research on the motivational foundations of nature experience has much to gain from developing closer linkages with research on self-regulation.

### *Practical Relevance*

The present research shows that which garden style people prefer is not, as is often thought, a matter of subjective aesthetic taste. Rather, preferences for garden styles are motivated by fundamental psychological needs that play a crucial role in human functioning. Gardens provide their owners with many benefits, including opportunities for exercise, restoration from stress, and social contacts (Dunnett and Quasim, 2000). It is not unlikely that people will be less able to enjoy these benefits if the type of their garden deviates too much from their personally preferred level of order and human influence, presumably because they do not feel self-fulfilled and personally satisfied in such gardens. The present research offers guidelines for which garden style fits best with which type of person, that may be used by garden owners, garden designers, horticulturists, and manufacturers of garden supplies.

From a broader perspective, the finding that contemplating or creating one's preferred garden style may contribute to the satisfaction of psychological needs underlines the crucial importance for people to have ready access to gardens in the first place.

Unfortunately, due to the ongoing processes of urban expansion and densification, more and more people are unable to afford their own home with a garden. Allotment gardens provide a viable alternative for those who do not have access to private garden space.

Yet, in most countries there is increasing pressure to use allotment sites for building and infrastructure developments. More insight into the fundamental needs on which people's preferences for gardens are predicated may eventually stimulate the development of more sustainable urban planning policies that facilitate the development of strong and satisfying human-nature relationships.

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