Chapter IV

Results and Discussion

The eleven categories that describe physical characteristics of headdress, or the characteristics of the wearer will be examined for variations over time and by place of origin. After the review of each of these overall characteristics, each headdress type will be considered in greater detail. Whenever possible and appropriate, contingency analysis, analysis of variance, or t-tests were used to test for significant variation between these characteristics and time or place of origin or between the characteristics of an individual headdress type and the sample as a whole. Chi squared, F-values, and t-values; degrees of freedom; and statistical significance at $\alpha = 0.05$ will be reported in the accompanying tables for each characteristic.

Variations in the Categories of Study Over Time and by Place of Origin

Variations in Headdress Type Over Time

Table 2 shows the relative frequencies of occurrence of each headdress type for each decade of the study period. Figure 19 shows that information graphically, so that the patterns of the rise and decline of the adoption of various headdress types may be more easily visualized. Contingency analysis was used to test the null hypothesis that the relative frequency of each individual headdress type did

Table 2. Relative Frequency of Headdress Types Per Decade

	Coif (%)	Hood (%)	Chaper. (%)	Sack (%)	Chapl. (%)	Rond. (%)	Caul (%)	Acorn (%)	Sugar. (%)	Bonnet (%)	Flat (%)	Stiff. (%)	Stock. (%)	Draped (%)	N
1400–1409	1.5	26.2	27.2	26.2	1.5	1.5	0.0	6.2	0.0	0.0	0.0	7.2	0.0	0.0	65
1410–1419	0.0	15.0	26.7	23.3	3.3	6.7	0.0	5.0	0.0	0.0	0.0	16.7	3.3	0.0	60
1420–1429	0.0	12.8	33.3	30.8	0.0	0.0	0.0	2.6	0.0	0.0	0.0	20.5	0.0	0.0	39
1430–1439	2.8	22.2	22.2	16.7	2.8	2.8	0.0	8.3	0.0	0.0	0.0	22.3	0.0	0.0	36
1440–1449	4.5	22.7	22.7	20.5	0.0	0.0	0.0	6.8	0.0	2.3	0.0	20.4	0.0	0.0	44
1450–1459	5.9	7.8	7.8	15.7	0.0	2.0	0.0	43.1	0.0	0.0	0.0	13.8	3.9	0.0	51
1460–1469	1.5	16.7	16.7	7.6	0.0	0.0	0.0	47.0	3.0	0.0	0.0	7.5	0.0	0.0	66
1470–1479	1.2	2.4	21.2	2.4	0.0	0.0	0.0	40.0	8.2	0.0	0.0	23.6	1.2	0.0	85
1480–1489	2.6	3.9	9.2	5.3	0.0	0.0	0.0	42.1	0.0	0.0	0.0	31.6	0.0	0.0	76
1490–1499	2.7	4.5	3.6	1.8	0.0	0.0	2.7	33.3	0.9	32.4	0.0	10.8	3.6	3.6	111
1500–1509	1.4	2.9	2.9	1.4	1.4	0.0	8.6	15.7	0.0	42.9	0.0	18.6	4.3	0.0	70
1510–1519	2.3	5.7	1.1	0.0	2.3	0.0	10.2	8.0	0.0	50.0	6.8	11.4	1.1	1.1	88
Overall	2.2	10.2	14.2	10.1	0.9	0.9	2.3	23.8	1.3	14.5	0.8	16.7	1.6	0.6	791
Chi Squared	*	32.04	42.71	44.44	*	*	*	167.7	*	317.9	*	32.36	*	*	
Degrees of Freedom	*	11	11	11	*	*	*	11	*	11	*	11	*	*	
Significance	*	S	S	S	*	*	*	S	*	S	*	S	*	*	

*These categories did not have large enough sample sizes for contingency analysis.

Chaper. = Chaperone Sack = Sack hat Chapl. = Chaplet Rond. = Rondelle Acorn = Acorn hat Sugar. = Sugarloaf hat Flat = Flat hat Stiff. = Stiffened hat Stock. = Stocking hat Draped = Draped headdress N = Number S = Significant NS = Not significant

not vary over time. The nature of the data did not allow a collective test of all the headdress types with respect to time. Acorn hats, bonnets, chaperones, hoods, sack hats, and stiffened hats had large enough samples to be tested. All of these types were found to vary significantly with time.

Some headdress types, chaplets, rondelles, draped headdress, and stocking caps, were found to be sporadically scattered throughout the period in relatively small amounts. Coifs had a constant presence throughout the study period, but were present in small relative frequencies.

Stiffened hats were also found steadily throughout the period, but their relative frequency varied significantly over time. Stiffened hats comprise more than 20% of all headdresses found for the periods 1420–1449 and 1470–1489. Stiffened hats were one of the predominate headdress type for the period 1470–1489 along with acorn hats.

Hoods, chaperones, sack hats, and acorn hats were also present throughout

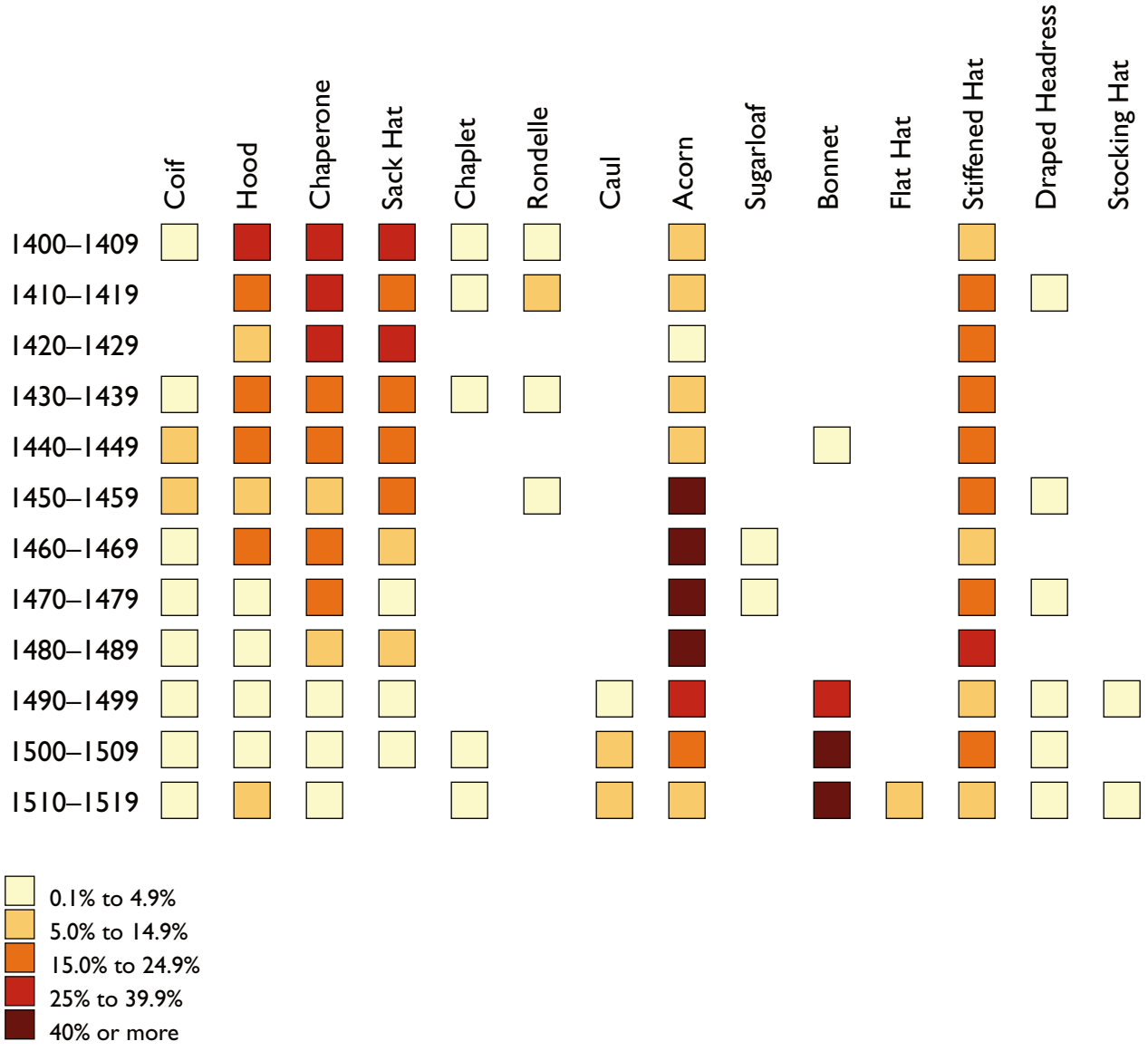

Figure 19.
Relative Frequency of Headdress Types by Decade

the study period, but there was a definite rise and fall of relative frequency for each of these four types of headdress. Hoods, chaperones and sack hats were popular at the beginning of the fifteenth century and slowly declined over the study period with some evidence of small revivals of the style.

Peak popularity of hoods was in the decade 1400–1409 with two smaller peaks 1430–1449 and 1460–69. Peak popularity of chaperones was in the decades 1400–1419 with a smaller peak 1460–1479. Peak popularity of sack hats were for the decades 1400–1429 with a smaller peak at 1440–49. The wearing of these three headdresses faded slowly with only sack hats disappearing before 1519.

Acorn hats appeared in small relative frequencies until 1450, when there was a dramatic increase in their use. Acorn hats constituted 40% or more of all headdress worn in the sample from 1450 to 1489 and slowly decreased in use, but had not disappeared entirely by 1519.

As the period of study ended, bonnets reached 40% or more in relative frequency. Before 1490, bonnets appeared in the sample in the 1440 to 1449 and 1480 to 1489 decade in very small frequencies. In the 1490s, bonnets suddenly exploded in popularity with relative frequencies of over 40% or more, as had the acorn hats earlier. In the last decade, 1510 to 1519, bonnets constituted 50% of all headdresses in the sample.

Flat hats made a brief appearance as a new style in the 1510 to 1519 decade. Extending the study period into the sixteenth century may show a similar pattern of increase and decline in the adoption of flat hats as seen for the acorn hats and bonnets.

Variations in Headdress Type by Place of Origin

Table 3 shows the relative frequencies of occurrence of each headdress type for each place of origin. Contingency analysis was used to test the null hypothesis that the relative frequency of headdress type did not vary by place of origin. The data did allow for a collective test and a significant relationship was found between headdress type and place of origin ($\chi^2 = 88.09$, df = 30). Acorn hats, bonnets, chaperones, hoods, sack hats, and stiffened hats had large enough samples to be tested and were tested individually. Acorn hats, for this analysis, included sugarloaf hats and stocking hats that were structurally related. Figure 20 shows the distribution of headdress types used in the analysis by place of origin. All of these types except hoods were found to vary significantly with place of origin. Although chaperones were found to vary significantly with place of origin, chi squared value was very close to the cut-off value for the $\alpha = 0.05$ level.

The 791 headdresses were distributed geographically in the following way: British Island, 8.8%; Burgundy/Flanders/Netherlands, 26.4%; France, 18.3; Holy Roman Empire; 13.8%; Italy, 20.0%; and Spain/Portugal, 12.5%. Each headdress type will be discussed indicating when the proportion of that headdress type for a given place of

Table 3. Relative Frequency of Headdress Types by Place of Origin

	BFN (%)	BI (%)	France (%)	HRE (%)	Italy (%)	S/P (%)	χ^2	DF	Sig.	N
Acorn Hat	23.9	4.8	20.2	6.4	26.6	18.1	15.4*	5	S	188
Stocking Hat	40.0	0.0	0.0	60.0	0.0	0.0	*	*	*	5
Sugarloaf Hat	60.0	10.0	20.0	0.0	0.0	10.0	*	*	*	10
Bonnet	16.5	10.4	19.1	16.5	15.7	21.7	13.9	5	S	115
Chaperone	34.8	14.3	13.4	12.5	17.9	7.1	11.3	5	S	112
Hood	27.3	11.1	22.2	13.6	16.0	9.9	2.3	5	NS	81
Sack Hat	13.8	16.2	15.0	16.2	30.0	8.8	15.6	5	S	80
Stiffened Hat	36.4	4.5	23.5	12.9	14.4	8.3	13.7	5	S	132
Other	25.0	5.9	10.3	29.4	20.6	8.8	16.0*	5	S	67
Caul	11.1	0.0	5.6	50.0	16.7	16.7	*	*	*	18
Chaplet	28.6	0.0	0.0	42.9	14.3	14.3	*	*	*	7
Coif	29.4	17.6	5.9	17.6	29.4	0.0	*	*	*	17
Draped Headdress	38.5	0.0	15.4	7.7	23.1	15.4	*	*	*	
Flat Hat	16.7	0.0	0.0	66.7	16.7	0.0	*	*	*	6
Rondelle	28.6	14.3	42.9	0.0	14.3	0.0	*	*	*	7
Overall	26.4	8.8	18.3	13.8	20.0	12.6		791		
N	209	70	145	109	158	100		791		

*Some categories had samples too small for analysis. Acorn hats, sugarloaf hats and stocking hats were combined into one category and cauls, chaplets, coifs, draped headdresses, flat hats and rondelles were combined into the "other" category.

BFN = Burgundy/Flanders/Netherlands BI = British Islands HRE = Holy Roman Empire S/P = Spain/Portugal
χ^2 = Chi squared DF = Degrees of freedom Sig. = Significance N = Number

origin was much higher or lower than the overall share of headdresses for that place of origin.

High proportions of acorn hats were found in Spain/Portugal. Low proportions of acorns hats were found in the British Islands and in the Holy Roman Empire. Bonnets were most abundant in Spain/Portugal, but the share of bonnets in Burgundy/Flanders/Netherlands was unusually low. However, the sample size for Burgundy/Flanders/Netherlands for the time

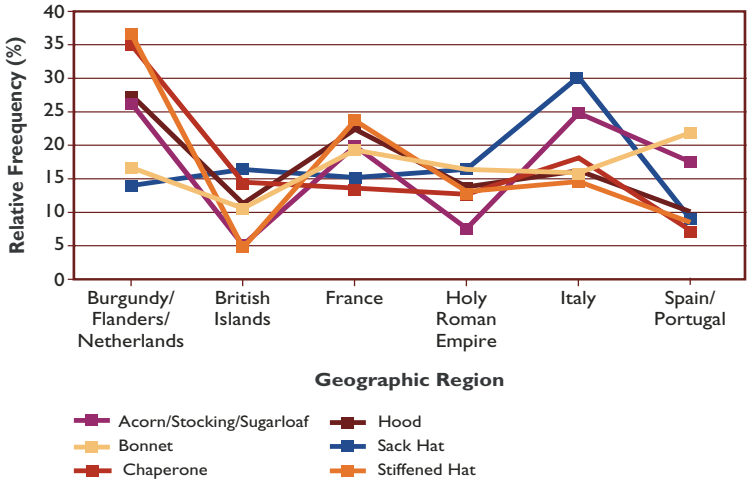

Figure 20
Relative Frequency of Headdress Types by Place of Origin

period in which bonnets were present was especially small, so the low proportion of bonnets in Burgundy/Flanders/Netherlands may be due to sampling error. Chaperones were disproportionately low in Spain/Portugal. Burgundy/Flanders/Netherlands and the British Islands had more than their shares of chaperones. Sack hats were unusually numerous in the British Islands, but were sparsely represented in Burgundy/Flanders/Netherlands. Burgundy/Flanders/Netherlands had more than their shares of stiffened hats, but the British Islands, and Spain/Portugal had less than their shares. Hoods were evenly distributed by place of origin.

Variations in Brim Type Over Time

Table 4 shows the relative frequencies of occurrence for each brim type for each decade of the study period. Figure 21 shows that information graphically. Contingency analysis was used to test the null hypothesis that the relative frequency of the brim types did not vary over time. The

Table 4. Relative Frequency of Brim Types by Decade

	Brimless (%)	Continuous (%)	Partial. (%)	Split (%)	Overlapping Split. (%)	Twisted or Padded Roll (%)	Rolled (%)	Robin Hood (%)	Multiple (%)	Total (%)	N
1400–1409	29.2	27.7	0.0	0.0	0.0	33.8	4.6	3.1	1.5	100.0	65
1410–1419	23.3	23.3	0.0	5.0	0.0	45.0	0.0	3.3	0.0	100.0	60
1420–1429	15.4	15.4	2.6	7.7	0.0	43.6	15.4	0.0	0.0	100.0	39
1430–1439	27.8	22.2	2.8	0.0	0.0	30.6	5.6	11.1	0.0	100.0	36
1440–1449	34.1	11.4	0.0	4.5	0.0	25.0	6.8	9.1	9.1	100.0	44
1450–1459	49.0	21.6	0.0	0.0	0.0	15.7	7.8	3.9	2.0	100.0	51
1460–1469	63.6	10.6	1.5	0.0	0.0	16.7	4.5	1.5	1.5	100.0	66
1470–1479	38.8	23.5	1.2	1.2	0.0	21.2	9.4	4.7	0.0	100.0	85
1480–1489	32.9	14.5	11.8	1.3	0.0	10.5	25.0	3.9	0.0	100.0	76
1490–1499	33.3	26.1	17.1	10.8	1.8	4.5	4.5	1.8	0.0	100.0	111
1500–1509	24.3	20.0	21.4	12.9	10.0	0.0	4.3	7.1	0.0	100.0	70
1510–1519	22.7	21.6	17.0	18.2	9.1	0.0	1.1	10.2	0.0	100.0	88
Overall	33.2	20.5	7.8	5.9	2.1	17.4	7.2	4.8	0.9	100.0	791
Chi Squared	33.73	10.91	67.28	87.67*	*	97.49	24.49†	†	††		
Degrees of Freedom	11	11	11	11	11	11	11	11	††		
Significance	S	NS	S	S	*	S	S	†	††		

*The samples sizes for split brims and overlapping split brims were too small for individual analysis, so they were combined.

† The sample sizes for rolled brims and Robin Hood brims were too small for individual analysis, so they were combined.

†† The category of multiple brims was excluded from statistical analysis.

N = Number S = Significant NS = Not significant

data did allow for a collective test, if some of the categories were combined and the category of multiple brims was excluded. There were only seven headdresses with multiple brims, less than 1% of the total number of headdresses, and this category could not be logically combined with any other. Brim type was found to vary significantly over time ($\chi^2 = 354.20$, df = 55). The brim type categories used were brimless, continuous, partial, combined split and overlapping split brims and padded or twisted roll, rolled, and Robin Hood. Each of the individual categories were tested as well, but rolled and Robin Hood brim categories were combined to give a large enough sample for analysis. The brim types of brimless, combined split and overlapping split brims, padded or twisted roll, and combined rolled and Robin Hood brims, were found to vary significantly with time. Continuous brims were not found to vary significantly over time.

Brimless headdresses peaked in frequency from 1450 to 1479 and maintained relative frequencies of 15% or higher throughout the study period. Padded or twisted roll brims had peak relative frequencies from 1400 to 1449 and their use generally declined for the rest of the study period. The largest concentrations of split and overlapping split brims were found from 1500 to 1519 and the lowest concentration found 1400 to 1409, 1430 to 1439, and from 1450 to

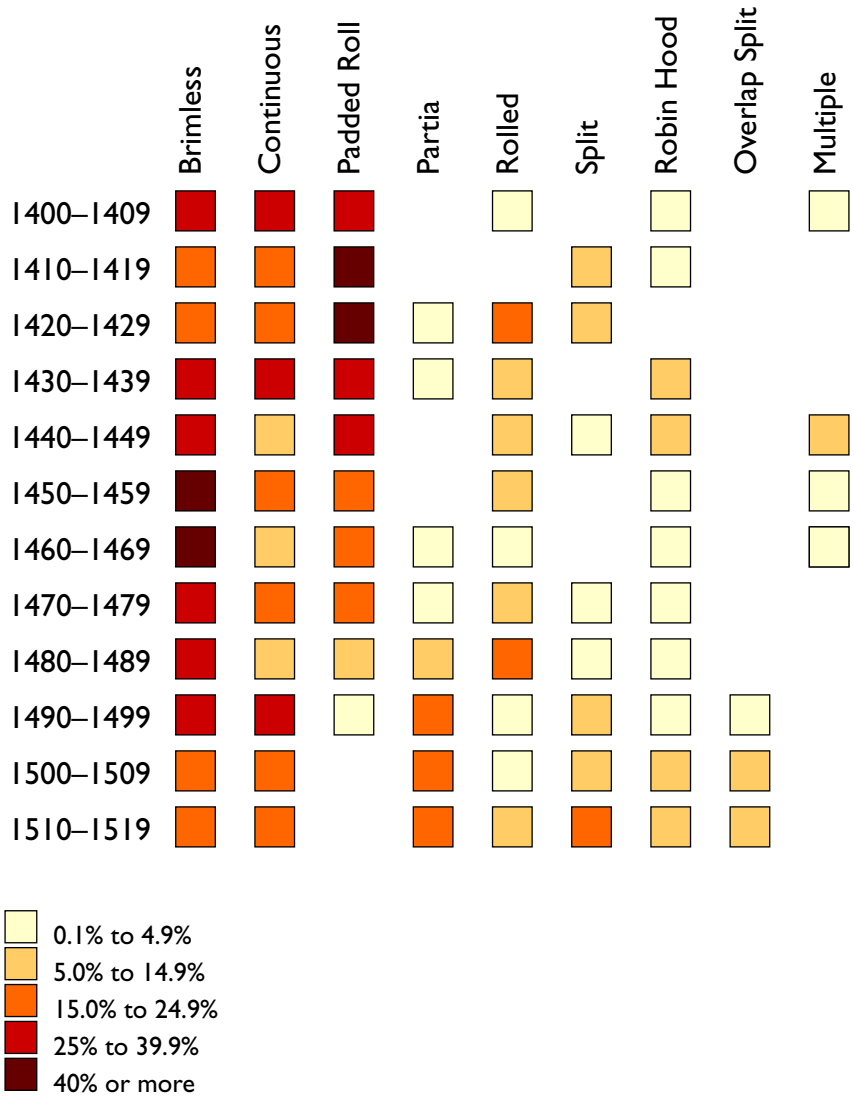

Figure 21
Relative Frequency of Brim Types by Decade

1489. Partial brims were found to have their largest concentrations from 1490 to 1519. Combined rolled and Robin Hood brims had their highest proportions from 1480 to 1489 with their lowest falling in the next decade, 1490 to

1499. This combined category showed a relative frequency of 15% or higher from 1420 to 1449.

Variations in Brim Type by Place of Origin

Table 5 shows the relative frequencies of occurrence for each brim type for each place of origin. Contingency analysis was used to test the null hypothesis that the relative frequency of the brim types did not vary by place of origin. The data did allow for a collective test, if some of the categories were combined. A significant relationship was found between headdress type and place of origin ($\chi^2 = 118.1$, df = 35). The brim type categories used were brimless, continuous brims, partial brims, split brims, overlapping split brims, padded or twisted roll brims, rolled brims, and Robin Hood brims. Each of the place of origin categories were tested as well with the above categories, except that split and overlapping split brims were combined into one category. Figure 22 shows the distribution of brim type categories used in the analysis by place of origin. Brim types were found to vary significantly with the places of origin, British Islands, France, the Holy Roman Empire, and Spain/Portugal, but not for Burgundy/Flanders/Netherlands or for Italy.

Padded and twisted roll brims were preferred in the British Islands while

Table 5. Relative Frequency of Brim Type by Place of Origin

	BFN (%)	BI (%)	France (%)	HRE (%)	Italy (%)	S/P (%)	Overall (%)	N
Brimless	36.4	31.4	31.7	24.8	36.7	34.0	33.2	263
Continuous	18.2	10.0	16.6	28.4	24.1	24.0	20.5	162
Partial	3.3	7.1	13.8	8.3	7.0	10.0	7.8	62
Twisted or Padded Roll	18.7	38.6	15.9	12.8	15.8	10.0	17.4	138
Rolled	10.5	5.7	15.9	2.8	1.3	3.0	7.2	57
Split	5.7	2.9	0.7	6.4	7.0	14.0	5.9	47
Robin Hood	5.7	2.9	4.8	8.3	3.8	2.0	4.8	38
Overlapping/Split	1.4	1.4	0.7	6.4	1.3	3.0	2.1	17
Multiple	0.0	0.0	0.0	1.8	3.2	0.0	0.9	7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	791
Number	209	70	145	109	158	100	791	
Chi Squared	10.5	24.9	37.8	15.8	10.0	18.3	118.1	
Degrees of Freedom	6	6	6	6	6	6	35	
Significance	NS	S	S	S	NS	S	S	

BFN = Burgundy/Flanders/Netherlands BI = British Islands S/P = Spain/Portugal N = Number NS = Not significant S = Significant

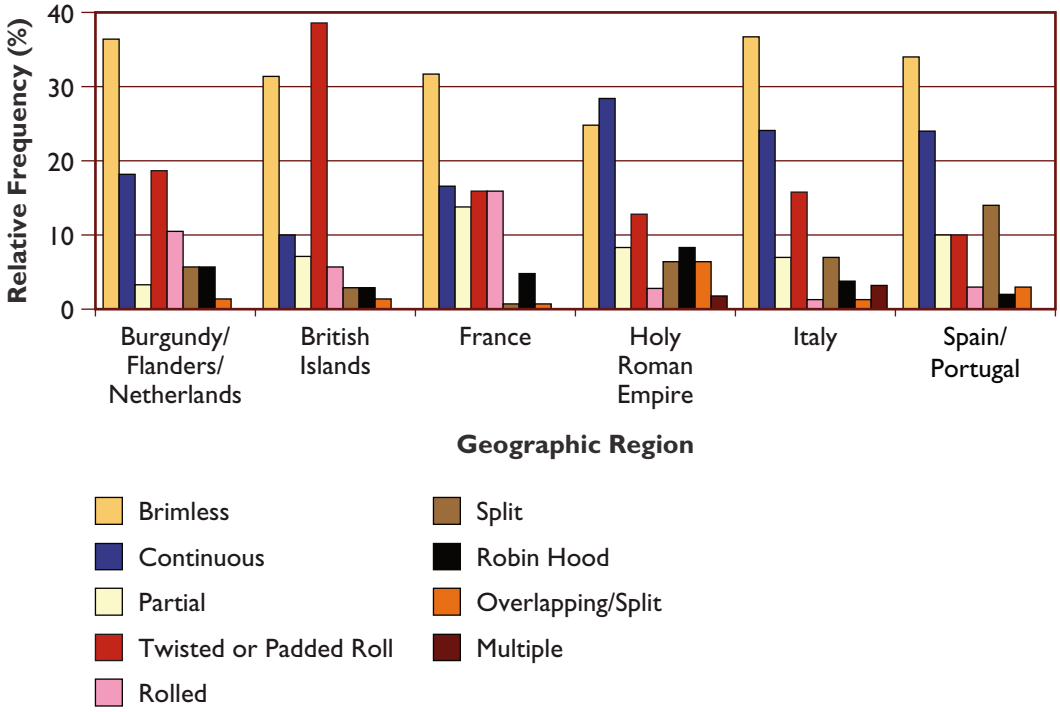

Figure 22
Relative Frequency of Brim Types by Place of Origin

continuous brims were found there infrequently. Combined split brims did not find much favor in France, but partial brims and rolled brims appeared there in relative frequencies larger than those for all headdresses. In the Holy Roman Empire, only partial brims appeared with a relative frequency that matched the overall distribution. Both higher concentrations of continuous brim, Robin Hood, and combined split and overlapping split brims, and lower concentrations of brimless, padded or twisted roll brims, or rolled brims were found there. Combined split brims and overlapping split brims were popular in Spain/Portugal, while padded and twisted roll brims were not.

Variations in Materials and Decoration Type Over Time

Since the materials used to construct a headdress cannot be definitively determined from a visual source, the variable, "material," for this study referred to whether the material of the headdress was unadorned in any way or was modified using a patterned material or applied decoration. Overall,

Table 6. Relative Frequency of Material by Decade

	Plain (%)	Decorated (%)	Chi Squared	Degrees of Freedom	Significance	Number
1400–1409	55.4	44.6	12.65	1	S	65
1410–1419	71.7	28.3	0.27	1	NS	60
1420–1429	69.2	30.8	0.59	1	NS	39
1430–1439	77.8	22.2	0.19	1	NS	36
1440–1449	86.4	13.6	3.22	1	NS	44
1450–1459	80.4	19.6	0.91	1	NS	51
1460–1469	90.9	9.1	9.27	1	S	66
1470–1479	82.4	17.6	2.70	1	NS	85
1480–1489	86.8	13.2	6.02	1	S	76
1490–1499	74.8	25.2	0.00	1	NS	111
1500–1509	58.6	41.4	9.48	1	S	70
1510–1519	64.8	35.2	4.47	1	S	88
Overall	74.6	25.4	49.78	11	S	791
Number	590	201				

S = Significant NS = Not significant

three times as many headdresses were undecorated than were decorated in any way. The most common types of decoration were applied jewelry, feathers or flowers, or cording or bands of trim.

Table 6 shows the relative frequencies of occurrence for whether the material was decorated or plain for each decade of the study period. Figure 23 shows that information graphically. Contingency analysis was used to test the null hypothesis that the relative frequency of whether a headdress was plain or decorated did not vary over time. The data did allow for a collective test. The tendency for decoration did vary significantly over time ($\chi^2 = 49.78$, df = 11). Each of the individual decades were tested as well. The decades 1400 to 1409, 1460 to 1469, 1480 to 1489, 1500 to 1509, and 1510 to 1519 were found to vary significantly from the overall proportions of plain material or decorated material. The decades 1400 to 1409, 1500 to 1509, and 1510 to 1509 showed a significant increase in the tendency for decoration. The decades 1460 to 1469 and 1480 to 1489 showed an increase in the tendency for plain materials. This suggests that ornamentation was most used at the beginning and end of the study period, but declines for the middle of the period.

An analysis was conducted to investigate the degree of ornamentation for decorated headdresses over time. The ratio of the number of decorations types used to the total number of decorated headdresses for each decade was calculated as was the ratio of the number of decoration types to the total number of decorated headdresses overall. T-tests were conducted to see if the ratios for

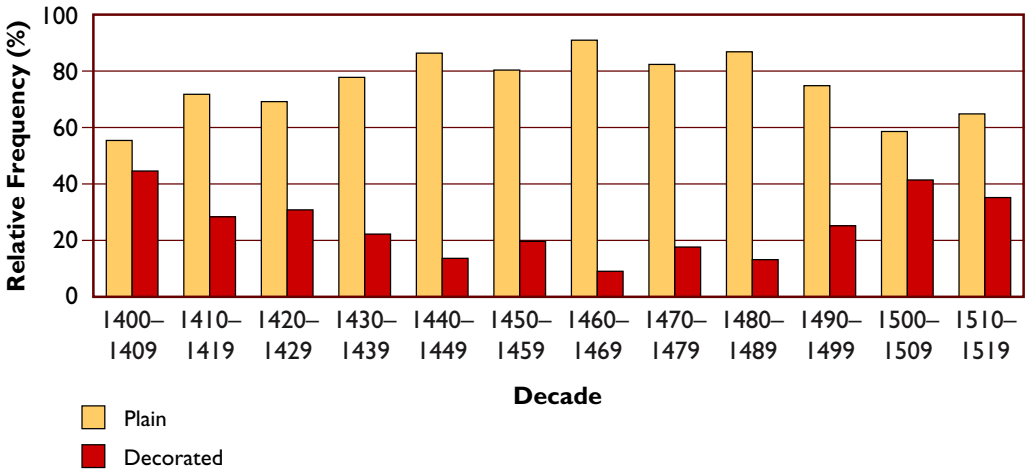

Figure 23
Relative Frequency of the Appearance of Decoration by Decade

each decade significantly varied from the overall ratio. Table 7 shows the results of this analysis. For the decades 1400 to 1409, not only were there more decorated headdresses than average, but each of these decorated headdresses had a more-than-average number of different decoration types. An inverse relationship was found for the decades 1460 to 1469 and 1480 to 1489. While relatively fewer headdresses were decorated in the 1460s and 1480s, those that were decorated used a more-than-average number of decoration types. The

Table 7. Decoration Types per Decorated Hats by Decade

	Decoration Types per Decorated Hat	t-value	Degrees of Freedom	Significance
1400–1409	1.41	2.80	64	S
1410–1419	1.35	0.75	59	NS
1420–1429	1.17	–2.95	38	S
1430–1439	1.25	–1.10	35	NS
1440–1449	1.00	–4.35	43	S
1450–1459	1.20	–2.11	50	S
1460–1469	1.67	4.72	65	S
1470–1479	1.33	0.29	84	NS
1480–1489	1.60	4.92	75	S
1490–1499	1.21	–3.11	110	S
1500–1509	1.38	1.77	69	NS
1510–1519	1.26	–1.92	87	NS
Overall	1.32			

S = Significant NS = Not significant

decades 1420 to 1429, 1440 to 1449 and 1450 to 1459, all showed disproportionately low numbers of decorations types per decorated headdress.

Table 8 shows the relative frequencies of each decoration type over time. Due to small sample sizes, contingency analysis could only be applied to the category of applied jewelry. The relative frequency of applied jewelry did not vary significantly over time when compared to the overall distribution of decoration types. Although statistical analysis could not be applied to the other types, some trends were suggested for some of the decorations types. The use of decorative lacing or "points" only occurs once before 1490 after which points were used from 13% to 18% of the time. Dagging was mostly concentrated in the period 1400 to 1449. Hat bands and cording or trim bands seemed to be more commonly used from 1430 to 1470.

Variations in Material and Decoration Types by Place of Origin

Table 9 shows the relative frequencies of occurrence for whether the material was decorated or plain for each place of origin. Figure 24 shows that information graphically. Contingency

Table 8. Relative Frequencies of Decoration Type by Decade

	1400 –1409 (%)	1410 –1419 (%)	1420 –1429 (%)	1430 –1439 (%)	1440 –1449 (%)	1450 –1459 (%)	1460 –1469 (%)	1470 –1479 (%)	1480 –1489 (%)	1490 –1499 (%)	1500 –1509 (%)	1510 –1519 (%)	Overall (%)	N
Applied Jewels	34.1	17.4	28.6	20..0	33.3	33.3	30.0	35.0	37.5	31.6	29.7	25.6	27.5	73
Hat Bands	2.4	0.0	14.3	10.0	0.0	16.7	0.0	30.0	6.2	5.3	0.0	2.6	5.7	15
Feathers/Flowers	7.3	0.0	0.0	0.0	0.0	8.3	20.0	20.0	18.8	28.9	21.6	17.9	14.0	37
Cording/Edging	12.2	4.3	0.0	30.0	0.0	33.3	30.0	0.0	12.5	2.6	10.8	7.7	10.2	27
Points/Laces	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	18.9	12.8	6.8	18
Dagging														
1	9.8	13.0	21.4	30.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	2.6	5.7	15
2	9.8	26.1	0.0	0.0	0.0	0.0	0.0	5.0	0.0	2.6	0.0	2.6	4.9	13
3	2.4	13.0	14.3	10.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	2.6	7
4	2.4	8.7	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.9	5
5	0.0	0.0	0.0	0.0	33.3	0.0	0.0	5.0	0.0	10.5	0.0	0.0	3.0	8
Embroidery	4.9	13.0	0.0	0.0	0.0	8.3	20.0	0.0	6.2	2.6	2.7	2.6	4.9	13
Slashes	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	2.6	5.4	7.7	4.9	13
Figured Fabrics	12.2	0.0	21.4	0.0	16.7	0.0	0.0	0.0	6.2	2.6	10.8	15.4	7.9	21
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	791
N	65	60	39	36	44	51	66	85	76	111	70	88	791	

The percentages represent the ratio of number of individual decoration types to the total number of decorations; not all hats in a decade were decorated.

N = Number of headdreses (decorated or not) in the decade or overall

Table 9. Relative Frequency of Material by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Plain	72.7	81.4	75.9	66.1	82.9	68.0	74.6	590
Decorated	27.3	18.6	24.1	33.9	17.1	32.0	25.4	201
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
N	209	70	145	109	158	100	791	
Chi Squared	0.38	1.73	0.12	4.19	5.77	2.29	14.49	
Degrees of Freedom	1	1	1	1	1	1	5	
Significance	NS	NS	NS	S	S	NS	S	
Decoration Types per Decorated Headdress	1.32	1.38	1.23	1.24	1.33	1.47	1.32	
t-value	–0.7	2.1	–6.0	–6.0	0.12	8.9		
Degrees of Freedom	208	69	144	108	157	99		
Significance	NS	S	S	S	NS	S		

NS = Not significant S = Significant

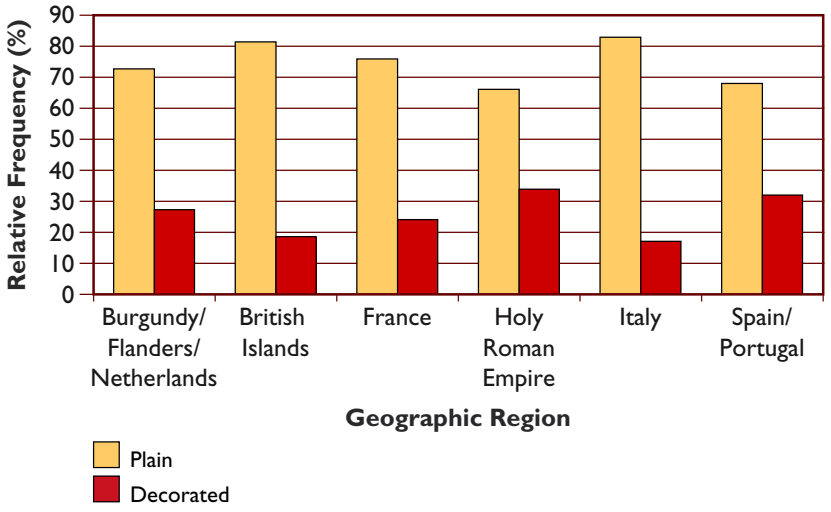

Figure 24
Relative Frequency of the Appearance of Decoration by Place of Origin

analysis was used to test the null hypothesis that the relative frequency of whether a headdress was plain or decorated did not vary by place of origin. The data did allow for a collective test. The tendency for decoration did vary significantly by place of origin (χ^2 = 14.49, df = 5). Each of the place of origin

categories were tested as well. Only the Holy Roman Empire and Italy showed significant variations from the overall proportions. The Holy Roman Empire had a disproportionately high number of decorated headdresses, while Italy had a disproportionately high number of plain headdresses.

An analysis was conducted to investigate the degree of ornamentation for decorated headdresses by place of origin. The ratio of the number of decorations types used to the total number of decorated headdresses for each place of origin was calculated as was the ratio of the number of decoration types to the total number of decorated headdresses overall. T-tests were conducted to see if the ratios for each place of origin significantly varied from the overall ratio. Table 9 also displays the results of this analysis. The British Islands and especially Spain/Portugal had disproportionately high numbers of decoration types per headdress. France and the Holy Roman Empire had unusually low proportions of decoration types per headdress. The Holy Roman Empire tended to have more decorated hats, but these used fewer decoration types than average.

Table 10 shows the relative frequencies of each decoration type by place of origin. Due to small sample sizes,

Table 10. Relative Frequency of Decoration Type by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Applied Jewels	26.7	38.9	25.6	26.1	36.1	21.3	27.5	73
Hat Bands	8.0	0.0	7.0	2.2	5.6	6.4	5.7	15
Feathers/Flowers	10.7	0.0	23.3	17.4	8.3	17.0	14.0	37
Cording/Edging	8.0	5.6	0.0	13.0	16.7	17.0	10.2	27
Points/Laces	4.0	5.6	7.0	4.3	13.9	8.5	6.8	18
Dagging Type								
1	9.3	22.2	9.3	0.0	0.0	0.0	5.7	15
2	9.3	0.0	4.7	2.2	2.8	4.3	4.9	13
3	5.3	5.6	2.3	2.2	0.0	0.0	2.6	7
4	2.7	0.0	4.7	0.0	2.8	0.0	1.9	5
5	2.7	0.0	0.0	13.0	0.0	0.0	3.0	8
Embroidery	4.0	0.0	4.7	4.3	2.8	10.6	4.9	13
Slashes	6.7	0.0	7.0	4.3	0.0	6.4	4.9	13
Figured Fabrics	2.7	22.2	4.7	10.9	11.1	8.5	7.9	21
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	791
Number	75	18	43	43	36	47	265	

N = Number

contingency analysis could only be applied to the categories of applied jewelry, flowers and feathers, and combined dag types. The relative frequencies of applied jewelry and flowers and feathers did not vary significantly by place of origin when compared to the overall distribution of decoration types. Combined dag types were most prevalent in Burgundy/Flanders/Netherlands and the British Islands and less commonly found in Italy and Spain/Portugal.

Overall Degrees of Visual Complexity

Gothic Art is often characterized as being ornate and Renaissance art is often characterized as being unadorned and pure of line. For most of this study period, Northern European artists still produced Gothic art, but Italy had adopted an aesthetic based on Graeco-Roman ideals, which can also be called an Renaissance aesthetic. By the end of the fifteenth century and the beginning of the sixteenth century, the Renaissance aesthetic had begun to spread north. Since many of the decorative arts tend to follow the same aesthetic, it would be useful to know whether clothing items also followed the spread of Renaissance aesthetics. In this study, the degree of visual complexity, or, how ornate the physical appearance of the headdress was used as a guide to test whether headdress becomes more or less ornate over the last decades of the study period as Renaissance ideas spread north and to test whether headdress in Italy was less ornate than in the rest of Europe. Both brim type and decoration practice were considered measures of visual complexity.

Brim types were classified as being one of five levels visual complexity, based on the amount of variation given to the eye in the design of the brim and the number of variations allowed in the position of the brim or brim segments. Table 11 displays the brim types and their levels.

A complexity index for brim type over time and by place of origin was created by multiplying the relative proportions

Table 11. Complexity Level of Brim Type

Level	Brim Type
1	Brimless
2	Continuous
3	Padded or Twisted Roll; Partial Brim; Rolled Brim
4	Split Brim; Robin Hood Brim
5	Overlapping Split Brim; Multiple Brims

of each brim type by its complexity level and summing the results. An overall complexity level was calculated and the results for each decade or each place of origin was compared to it.

Decoration was used in two ways. The percentage of decorated headdress of all headdresses for each decade and each place of origin was compared to an overall percentage. Also the proportion of decoration types per decorated headdress, as calculated above, for each decade and each place of origin was compared to the overall proportion of decoration types per decorated headdress. The results for all three indicators are summarized in Tables 12 and 13. Bold face is used to show decades or places of origin whose complexity indicators were higher than the overall.

While each of the indicators were not in complete agreement, the general trend over time seems to be that headdresses had a higher level of complexity in the

Table 12. Indicators of Complexity By Place of Origin

	Brim Type	Percentage of Decorated Headdresses	Number of Decoration Types per Decorated Headdress
BFN	2.23	27.3	1.32
British Islands	2.36	18.6	1.38
France	2.27	24.1	1.23
HRE	2.53	33.9	1.24
Italy	2.22	17.1	1.33
Spain/Portugal	2.30	32.0	1.47
Overall	2.30	25.4	1.32

Table 13. Indicators of Complexity By Decade

	Brim Type	Percentage of Decorated Headdresses	Number of Decoration Types per Decorated Headdress
1400–1409	2.20	44.6	1.41
1410–1419	2.38	28.3	1.35
1420–1429	2.62	30.8	1.17
1430–1439	2.33	22.2	1.25
1440–1449	2.52	13.6	1.00
1450–1459	1.88	19.6	1.20
1460–1469	1.67	9.1	1.67
1470–1479	2.05	17.6	1.33
1480–1489	2.25	13.2	1.60
1490–1499	2.23	25.2	1.21
1500–1509	2.71	41.4	1.38
1510–1519	2.80	35.2	1.26
Overall	2.30	25.4	1.32

early part of the fifteenth century, approximately from 1400 to 1429. There was a period of relatively low complexity from 1440 to 1499. Finally, complexity increased from 1500 to 1519. Percentage of decorated headdress and brim type seem to be in agreement, but there were several exceptions for the proportion of decoration types per decorated hats indicator.

For places of origin, the trend seems to be higher complexity headdresses for the British Islands, the Holy Roman Empire, and Spain/Portugal. Lower complexity headdresses were found in France, Italy, and Burgundy/Flanders/Netherlands. Italy was indeed found to have headdresses with lower complexity, but it was joined by two places of origin that were the centers of the International Gothic style. Again, as with time, there were several exceptions for the proportion of decoration types per decorated hats indicator for Italy and the Holy Roman Empire.

Variations in Color Over Time

Table 14 shows the relative frequencies of occurrence for each color for each decade of the study period.

Table 14. Relative Frequency of Color by Decade

	Red (%)	Black (%)	Blue (%)	Brown (%)	White (%)	Yellow (%)	Green (%)	Grey (%)	Orange (%)	Purple (%)	Total (%)	N
1400–1409	23.6	7.3	25.5	3.6	7.3	9.1	14.5	7.3	0.0	1.8	100.0	55
1410–1419	18.9	30.2	17.0	11.3	5.7	5.7	3.8	7.5	0.0	0.0	100.0	53
1420–1429	37.1	11.4	25.7	17.1	2.9	5.7	0.0	0.0	0.0	0.0	100.0	35
1430–1439	37.0	18.5	18.5	11.1	11.1	0.0	3.7	0.0	0.0	0.0	100.0	27
1440–1449	55.0	17.5	5.0	7.5	7.5	2.5	2.5	2.5	0.0	0.0	100.0	40
1450–1459	36.4	31.8	9.1	9.1	4.5	4.5	2.3	2.3	0.0	0.0	100.0	44
1460–1469	58.5	22.6	1.9	9.4	3.8	0.0	1.9	1.9	0.0	0.0	100.0	53
1470–1479	37.5	25.0	7.1	8.9	5.4	0.0	5.4	7.1	3.6	0.0	100.0	56
1480–1489	25.4	35.6	11.9	11.9	11.9	0.0	1.7	1.7	0.0	0.0	100.0	59
1490–1499	31.1	24.4	0.0	8.9	13.3	4.4	2.2	8.9	6.7	0.0	100.0	45
1500–1509	36.8	21.1	7.0	8.8	8.8	7.0	8.8	0.0	1.8	0.0	100.0	57
1510–1519	30.0	30.0	6.0	6.0	6.0	14.0	2.0	4.0	2.0	0.0	100.0	50
Overall	35.0	23.5	10.8	9.3	7.3	4.5	4.4	3.8	1.2	0.2	575	
Number	201	135	62	53	42	26	25	22	7	1	575	
Chi Squared	21.27	17.54	32.34†	5.60*†	*	32.75*	*	*	*	*	116.7	
Degrees of Freedom	11	11	9†	10†	*	10	*	*	*	*	44	
Significance	S	NS	S†	NS*†	*	S	*	*	*	*	S	

*Due to small samples sizes, brown and white were combined into one category, and the remaining colors were combined into one category. Chi squared values are given for brown and white under "Brown" and for the remaining colors under "Yellow."

† Due to small sample sizes, some decades were combined for analysis.

N = Number S = Significant NS = Not significant

Contingency analysis was used to test the null hypothesis that the relative frequency of each color did not vary over time. The data did allow for a collective test, if some of the categories were combined. A significant relationship was found between color and decade ($\chi^2 = 123.4$, df = 44). The color categories used were red, black, blue, brown and white, and all others. Each of the individual categories were tested as well. Figure 25 shows the distribution of the color categories used for analysis over time. The color categories, red, blue, and all others, were found to vary significantly with time. Due to the use of some black and white reproductions and media that were not colored, the total sample size for analysis was 574.

By and large the most popular color for headdresses from 1400–1519 was red, used in 35.0% of all headdresses. Black was second with 23.5% of all headdresses, blue and brown were well behind with 10.8% and 9.3% respectively. White (7.3%); yellow (4.5%); green (4.4%); grey (3.8%); orange (1.2%); and purple (0.2%) completed the sample.

The use of red peaked from 1440 to 1469 and the peak for red tended to follow the popularity of acorn hats. Blue was more widely used from 1400 to 1429 and declined for the rest of the study period. The relative frequency of headdresses other than red, black, blue, brown or white were high for the beginning and the end of the study period, but fewer colors were used in the middle of the fifteenth century, and these were used less often than that the beginning or end of the study period. The proportions of black and brown/white remained the same throughout the study period.

Headdress types with earlier popularity peaks (hoods, chaperones, and sacks) had a stronger proportion of blue and less of black than later-occurring headdress types, while the use of blue declined with headdresses with later popularity peaks.

Variations in Color by Place of Origin

Table 15 shows the relative frequencies of occurrence for each color for each place of origin. Contingency analysis was used to test the null hypothesis that the relative frequency of each color did not vary by place of origin. The data did allow for a collective test, if some of the categories were combined. A significant relationship was found between headdress type and place of origin ($\chi^2 = 47.72$, df = 20). The color categories used were red, black, blue, brown and white, and all others. Each of the individual categories were tested as well. Figure 26 shows the distribution of the color of headdresses by place of origin. Due to the use of some black and white reproductions and media that were not colored, the total sample size for analysis was 574.

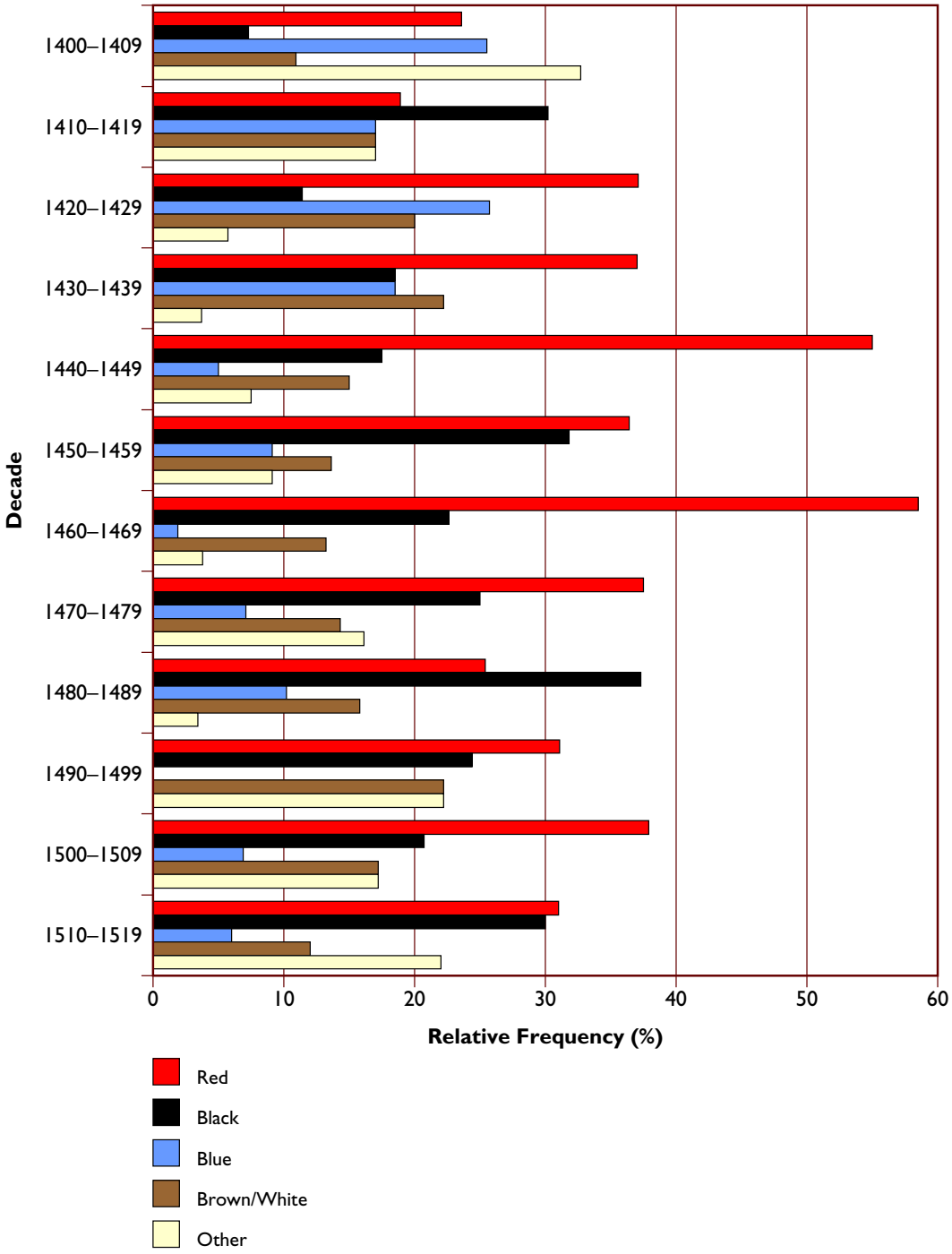

Figure 25
Relative Frequency of the Color by Decade

Table 15. Relative Frequency of Color by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Red	31.3	37.0	30.8	36.4	47.5	26.5	35.1	201
Black	28,1	11.1	25.8	16.7	20.0	24.5	23.6	135
Blue	10.9	33.3	11.7	3.0	10.8	6.1	10.8	62
Brown	12.5	3.7	7.5	10.6	5.8	10.2	9.3	53
White	5.2	7.4	5.0	12.1	8.3	12.2	7.3	42
Yellow	3.1	0.0	4.2	7.6	3.3	8.2	4.2	24
Green	3.7	0.0	5.8	10.6	1.7	4.1	4.4	25
Grey	4.2	0.0	6.7	1.5	2.5	4.1	3.8	22
Orange	1.0	7.4	2.5	0.0	0.0	4.1	1.2	9
Purple	0.0	0.0	0.0	1.5	0.0	0.0	0.2	1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	574
N	192	27	120	66	120	49	574	
Chi Squared	1.61	*	3.90	13.93	8.14	9.40	47.53	
Degrees of Freedom	4	*	4	4	4	4	20	
Significance	NS	*	NS	S	NS	NS	S	

*The sample size for the British Islands was too small for analysis.

N = Number NS = Not significant S = Significant

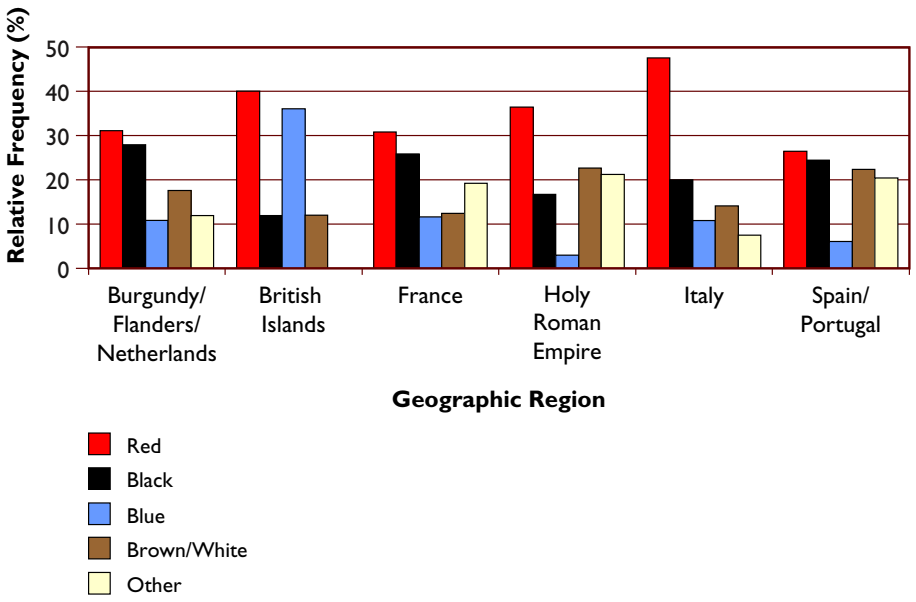

Figure 26
Relative Frequency of the Color by Place of Origin

All colors were found to be evenly distributed among the six places of origin categories except for the Holy Roman Empire. Headdresses there were less likely to be blue and more likely to be brown/white or one of the "other" category colors. Although the sample size for the British Islands was too small for contingency analysis, blue appeared to be very popular in that location.

Variations in the Characteristics of Head Coverage

Two categories were used to describe the characteristics of head coverage. "Coverage of the Hair-Growing Area" measured how much of the head except the face was covered by headdress. "Coverage of the Ears" recorded whether the ears were covered or not.

Variations in the Coverage of the Hair-Growing Area Over Time

Table 16 shows the relative frequencies of the hair-growing area covered by the headdress for each decade of the study period. Contingency analysis was used to test the null hypothesis that the relative distribution of the coverage of the hair-growing area did not vary over time. The data did allow for a collective test if the categories of 0% to 25% and 25% to 50% were combined. Figure 27 shows the relative frequencies of the coverage categories used in analysis

Table 16. Relative Frequency of Coverage of the Hair-Growing Area by Decade

	0% to 25% (%)	25% to 50% (%)	50% to 75% (%)	75% to 100% (%)	Chi Squared*	Degrees of Freedom	Sig.	N
1400–1409	0..0	14.0	32.0	54.0	12.11	2	S	50
1410–1419	0.0	9.8	37.3	52.9	12.24	2	S	51
1420–1429	0.0	3.0	24.2	72.7	21.68	2	S	33
1430–1439	3.4	10.3	31.0	55.2	7.76	2	S	29
1440–1449	0.0	2.6	51.3	46.2	2.99	2	NS	39
1450–1459	2.2	20.0	46.7	31.1	0.00	2	NS	45
1460–1469	0.0	17.0	64.2	18.9	6.93	2	S	53
1470–1479	0.0	28.9	56.6	14.5	9.98	2	S	76
1480–1489	1.5	33.8	40.0	24.6	6.32	2	S	65
1490–1499	0.0	34.6	49.0	16.3	14.40	2	S	104
1500–1509	3.0	25.8	48.5	22.7	2.77	2	NS	66
1510–1519	3.6	19.0	51.2	26.2	1.11	2	NS	84
Overall	1.2	21.3	46.3	31.2	98.29	22	S	695
N	8	148	322	214				695

* Due to small sample sizes, "0% to 25%" and "25% to 50%," were combined into one category for contingency analysis.

Sig. = Significance N = Number S = Significant NS = Not significant

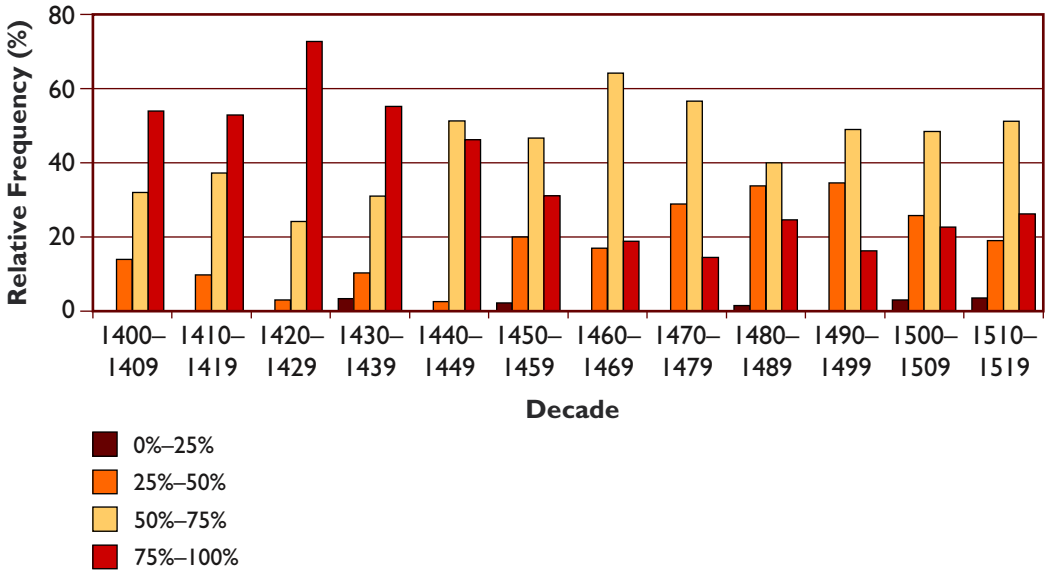

Figure 27
Relative Frequency of the Coverage of the Hair-growing Area by Decade

over time. A significant relationship was found between coverage of the head and decade ($\chi^2 = 98.29$, df = 22). Each of the individual categories were tested as well. All of the categories were found to vary significantly with time.

From 1400 to 1439, the dominant amount of coverage was 75%–100%. The peak decade for the 75%–100% coverage was 1420 to 1429. In the 1440s the dominant amount of coverage shifted to 50%–75% and remained the dominant amount of coverage for the rest of the study period. The peak period for 50%–75% head coverage was 1460 to 1479. However, from 1470 to 1509, relatively more of the headdresses fell into the 0%–50% classification than fell into the 75%–100% category, demonstrating a tendency towards headdress that covered even less of the head. The peak period for the 0%–50% category was 1480 to 1499. A reversal to this trend is suggested by the data for the last decade, in which the relative frequency of headdresses that covered 75% or more of the head was larger than the relative frequency of headdresses that covered less than 50% of the head.

Variations in the Coverage of the Hair-Growing Area by Place of Origin

Table 17 shows the relative frequencies of the hair-growing area covered

Table 17. Relative Frequency of Coverage of the Hair-Growing Area by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
0% to 25%	0.6	0.0	0.8	1.9	2.0	1.1	1.2	8
25% to 50%	19.9	7.0	28.0	15.4	20.4	31.9	21.3	148
50% to 75%	46.2	49.1	44.0	46.2	51.0	40.7	46.3	322
75% to 100%	33.3	43.9	27.2	36.5	26.5	26.4	31.2	53
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	695
N	171	57	125	104	147	91	695	
Chi Squared	0.522	9.06	3.08	2.16	1.75	5.80	22.37	
Degrees of Freedom	2	2	2	2	2	2	10	
Significance	NS	S	NS	NS	NS	NS	S	

BFN = Burgundy/Flanders/Netherlands HRE = Holy Roman Empire N = Number NS = Not significant
S = Significant

by the headdress for each place of origin. Contingency analysis was used to test the null hypothesis that the relative distribution of the coverage of the hair-growing area did not vary by place of origin. The data did allow for a collective test if the categories of 0% to 25% and 25% to 50% were combined. Figure 28 shows the relative frequencies of the coverage categories used in analysis by place of origin. A significant relationship was found between coverage of the head and place of origin ($\chi^2 = 22.37$, df = 10). Each of the individual places of origin were tested as well. Coverage of the hair-growing area was found to vary significantly in the British Islands only. The British Islands had an unusually high proportion of headdresses covering 75%–100% of the head, and unusually low proportion of headdresses covering less than 50% of the head. For all locations, the dominant coverage was 50%–75%.

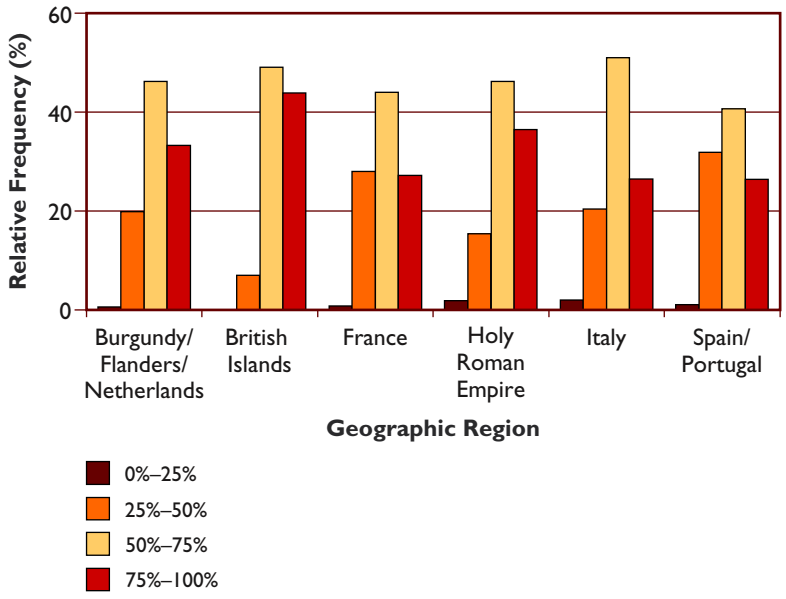

Figure 28
Relative Frequency of the Coverage of the Hair-growing Area by Geographic Origin

Variations in the Coverage of the Ears Over Time

Table 18 shows the relative frequencies for whether the ears were covered, and if so, whether they were entirely or partially covered for each decade of the study period. Contingency analysis was used to test the null hypothesis that the relative distribution of the coverage of the ears categories did not vary over time. The data did allow for a collective test if the categories of "partially covered" and "completely covered" were combined. Figure 29 shows the relative frequencies of the coverage of the ears categories used in analysis over time. A significant relationship was found between coverage of the ears and decade ($\chi^2 = 35.30$, df = 11). Each of the individual categories was tested as well. The combined category of partially and completely covered was found to vary significantly with time.

Ears were not covered by headdress 72.2% of the time, but from 1400 to 1429, headdresses that covered the ears either partially or completely constituted a much higher proportion of headdresses during those decades than for headdresses overall. From 1460 to 1489, ears were less likely to be covered by headdress than they would have been overall.

Table 18. Relative Frequency of the Coverage of the Ears by Decade

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	Chi Squared	Degrees of Freedom	Sig.	N
1400–1409	61.5	26.2	12.3	3.68	2	NS	65
1410–1419	56.7	36.7	6.7	12.00	2	S	60
1420–1429	51.3	35.9	12.8	6.13*	1	S	39
1430–1439	66.7	19.4	13.9	0.55*	1	NS	36
1440–1449	65.9	15.9	18.2	0.86*	1	NS	44
1450–1459	74.5	11.8	13.7	0.14*	1	NS	51
1460–1469	84.8	10.6	4.5	5.27	2	NS	66
1470–1479	83.5	14.1	2.4	6.57	2	S	85
1480–1489	80.3	13.2	6.6	2.49	2	NS	76
1490–1499	76.6	16.2	7.2	1.07	2	NS	111
1500–1509	72.9	18.6	8.6	0.02	2	NS	70
1510–1519	70.5	20.5	9.1	0.14	2	NS	88
Overall	72.2	19.1	8.7	35.30*	11	S	791
N	571	151	69				791

*Due to small sample sizes, "partially covered" and "completely covered" were combined into one category for contingency analysis.

Sig. = Significance N = Number NS = Not significant S = Significant

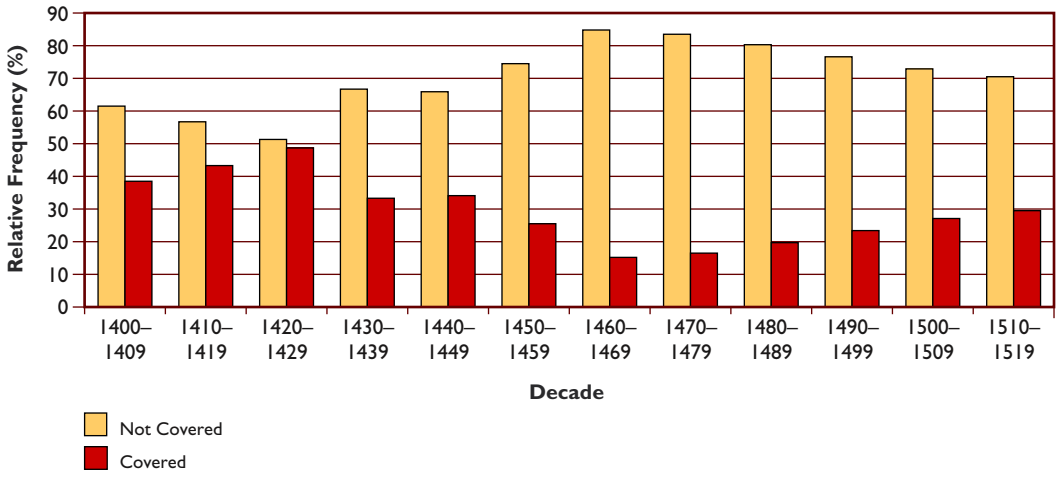

Figure 29
Relative Frequency of the Coverage of the Ears by Decade

Variations in the Coverage of the Ears by Place of Origin

Table 19 shows the relative frequencies of the amount of the ears covered by the headdress for each place of origin. Contingency analysis was used to test the null hypothesis that the relative distribution of the coverage of the ears categories did not vary by place of origin. The data did allow for a collective test. A significant relationship was found between coverage of the ears and place of origin ($\chi^2 = 24.26$, df = 10). Each of the individual places of origin were tested as well. Figure 30 shows the relative frequencies of the coverage of the ears categories used in analysis

Table 19. Relative Frequency of Coverage of the Ears by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Not Covered	71.3	61.4	75.2	63.3	79.7	75.0	72.2	571
Partially Covered	18.7	31.4	20.7	22.9	13.9	13.0	19.1	151
Completely Covered	10.0	7.1	4.1	13.8	6.3	12.0	8.7	69
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	791
N	209	70	145	109	158	100	791	
Chi Squared	0.464	6.90	3.87	5.21	4.51	3.31	24.26	
Degrees of Freedom	2	2	2	2	2	2	10	
Significance	NS	S	NS	NS	NS	NS	S	

BFN = Burgundy/Flanders/Netherlands HRE = Holy Roman Empire N = Number NS = Not significant S = Significant

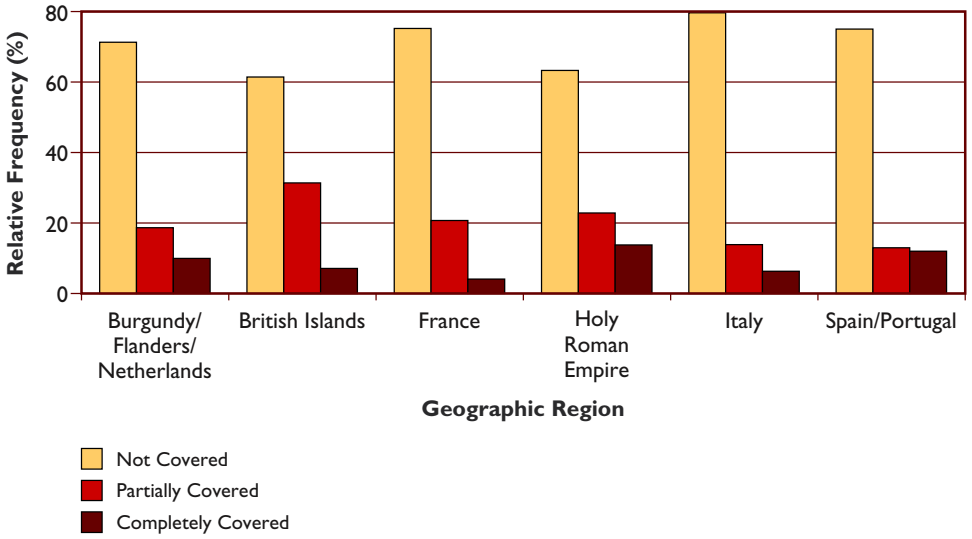

Figure 30
Relative Frequency of the Coverage of the Ears by Geographic Region

by place of origin. Coverage of the ears was found to vary significantly in the British Islands only. The British Islands had an unusually high proportion of headdresses partially covering the ears, and unusually low proportion of headdresses not covering the ears. The Holy Roman Empire showed a similar trend, but it was not found to be statistically significant.

Variations in the Position of Headdresses Over Time

Table 20 shows the relative frequencies for whether the headdress was worn positioned on the head, lying on the shoulder, carried in the hand, lying on the floor or ground, and if the headdress was positioned on the head, whether it was worn centered or tilted left or right for each decade of the study period. This variable was also used to record whether more than one headdress were worn simultaneously. Contingency analysis was used to test the null hypothesis that the relative distribution of the positions of the headdress did not vary over time. The data did allow for a collective test if the categories of "centered," "left," and "right" were combined into a overall category of "on head" and the other categories of "shoulder," "hand," and "ground or floor" combined into an overall category of "off head". Figure 31 shows the relative frequencies of the position of headdress categories used in analysis over time. A significant relationship was found between whether the headdress was worn on or off the head and decade ($\chi^2 = 30.59$, df = 11). Each of the individual categories

Table 20. Relative Frequency of the Position of Headdress by Decade

	Centered (%)	Tilted Left (%)	Tilted Right (%)	On Shoulder (%)	In Hand (%)	On Ground (%)	Chi Squared*	DF	Sig.	N
1400–1409	76.9	0.0	0.0	18.5	4.6	0.0	8.55	1	S	65
1410–1419	83.3	3.3	3.3	10.0	0.0	0.0	0.13	1	NS	60
1420–1429	84.6	0.0	0.0	10.3	5.1	0.0	†	1	†	39
1430–1439	80.6	0.0	0.0	16.7	0.0	2.8	†	1	†	36
1440–1449	88.6	0.0	0.0	11.4	0.0	0.0	0.00	1	NS	44
1450–1459	86.3	2.0	0.0	7.8	3.9	0.0	0.00	1	NS	51
1460–1469	77.3	0.0	3.0	16.7	3.0	0.0	1.56	1	NS	66
1470–1479	88.2	1.2	0.0	8.2	2.4	0.0	0.07	1	NS	85
1480–1489	80.3	1.3	2.6	7.9	5.3	2.6	1.37	1	NS	76
1490–1499	77.5	8.1	9.0	1.8	3.6	0.0	4.06	1	S	111
1500–1509	78.6	5.7	11.4	1.4	1.4	1.4	3.58	1	NS	70
1510–1519	78.4	10.2	8.0	3.4	0.0	0.0	5.66	1	S	88
Overall	81.2	3.4	3.9	8.5	2.5	0.5	30.59	11	S	791
N	642	27	31	67	20	4				791

*Due to small sample sizes, "centered," "tilted right," and "tilted left" were combined into the category, "on head," and "on shoulder," "in hand," and "on ground" were combined into the category, "off head" for contingency analysis.

†Even with combining categories, the expected values were too small to allow for contingency analysis for these decades.

DF = Degrees of freedom Sig. = Significance N = Number S = Significant NS = Not significant

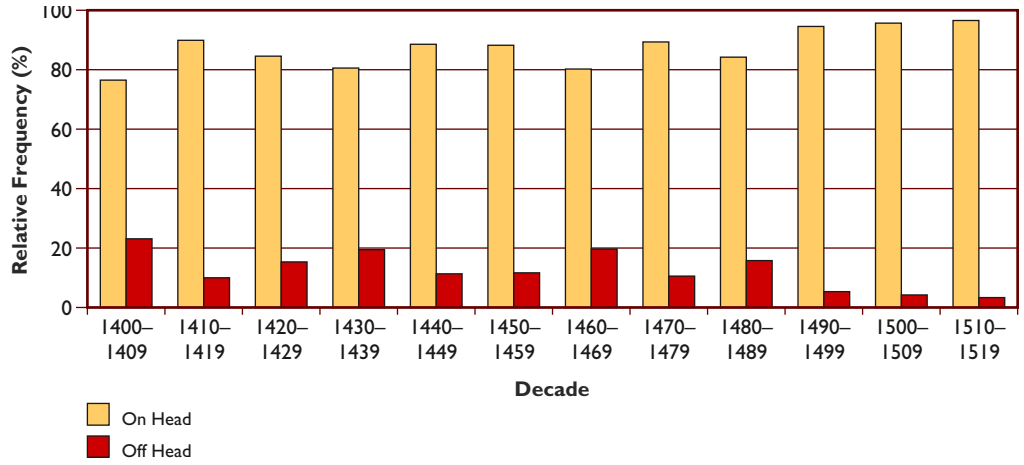

Figure 31
Relative Frequency of the Position of Headdress by Decade

were tested as well. The category, "off head" was found to vary significantly with time.

88.5% of all headdress was worn on the head, 82.1% of which was worn centered on the head. Headdresses not worn on the head were most commonly worn draped over the shoulder, (73.6% of the time). The relative proportion of headdresses worn on the head did not vary significantly over time, but the relative proportion of headdresses not worn on the head did. There was a higher proportion of headdresses not worn on the head for the decade 1400 to 1409, than overall, and lower proportions for the decades 1490 to 1499 and 1510 to 1519.

The wearing of multiple headdress at the same time was also recorded. Two-tailed t-tests were used to determine if the proportion of multiple headdress varied from the overall proportion of multiple headdress. Table 21 summarizes the results. Only the decades 1430 to 1439 and 1430 to 1449 showed significant variation from the overall proportion. In these decades, the use of multiple headdress was about twice as frequent as for the sample overall.

Variations in the Position of Headdresses by Place of Origin

Table 22 shows the relative frequencies for whether the headdress was worn positioned on the head, lying on the shoulder, carried in the hand, lying on the floor or ground, and if the headdress was positioned on the head, whether it was worn centered

Table 21. Relative Frequency of Multiple Headdress by Decade

	Multiple Headdress (%)	t-value	Degrees of Freedom	Significance	Number
1400–1409	21.5	0.14	64	NS	65
1410–1419	15.0	–1.46	59	NS	60
1420–1429	20.5	–0.24	38	NS	39
1430–1439	44.4	2.64	35	S	36
1440–1449	40.9	2.46	43	S	44
1450–1459	21.6	–0.12	50	NS	51
1460–1469	16.7	–0.93	65	NS	66
1470–1479	12.9	–1.74	84	NS	85
1480–1489	23.7	0.22	75	NS	76
1490–1499	20.7	–0.35	110	NS	111
1500–1509	25.7	0.55	69	NS	70
1510–1519	22.7	0.06	87	NS	88
Overall	22.7				
Number	177				791

NS = Not significant S = Significant

Table 22. Relative Frequency of the Position of Headdress by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Centered	79.4	82.9	77.2	80.7	87.3	81.0	72.2	643
Tilted Left	1.4	1.4	3.4	8.3	2.6	5.0	3.4	27
Tilted Right	2.4	0.0	5.5	6.4	3.2	6.0	3.9	31
On Shoulder	13.4	12.9	9.7	2.8	6.3	2.0	8.5	66
In Hand	2.4	2.9	4.1	0.9	0.6	5.0	2.5	20
On Ground	1.0	0.0	0.0	0.9	0.0	1.0	0.5	4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	791
N	209	70	145	109	158	100	791	
Chi Squared*	5.64	1.22	0.746	3.85	3.20	3.03	15.87	
Degrees of Freedom	1	1	1	1	1	1	5	
Significance	S	NS	NS	S	NS	NS	S	

* Due to small sample sizes, "centered," "tilted right," and "tilted left" were combined into the category, "on head," and "on shoulder," "in hand," and "on ground" were combined into the category, "off head" for contingency analysis.

N = Number S = Significant NS = Not significant

or tilted left or right for each place of origin. Contingency analysis was used to test the null hypothesis that the relative distribution of the positions of the headdress did not vary by place of origin. The data did allow for a collective test if the categories of "centered," "left," and "right" were combined into a overall category of "on head" and the other categories of "shoulder," "hand," and "ground or floor" combined into an overall category of "off head." Figure 32 shows the relative frequencies of the position of headdress categories used in analysis by place of origin. A significant relationship was found between whether the headdress was worn on or off the head and place of origin ($\chi^2 = 15.87$, df = 5). Each of the individual places of origin were tested as well. Burgundy/Flanders/Netherlands had an unusually high proportion of headdresses worn off of the head, and unusually low proportion of headdresses worn on the head. The opposite trend was found for the Holy Roman Empire.

Again, two-tailed t-tests were used to determine if the proportion of multiple headdress varied from the overall proportion of multiple headdress by place of origin. Table 23 summarizes the results. Italy showed significant variation from the overall proportion with the frequency of multiple headdress only one-fourth of the proportion of the frequency of multiple headdress overall.

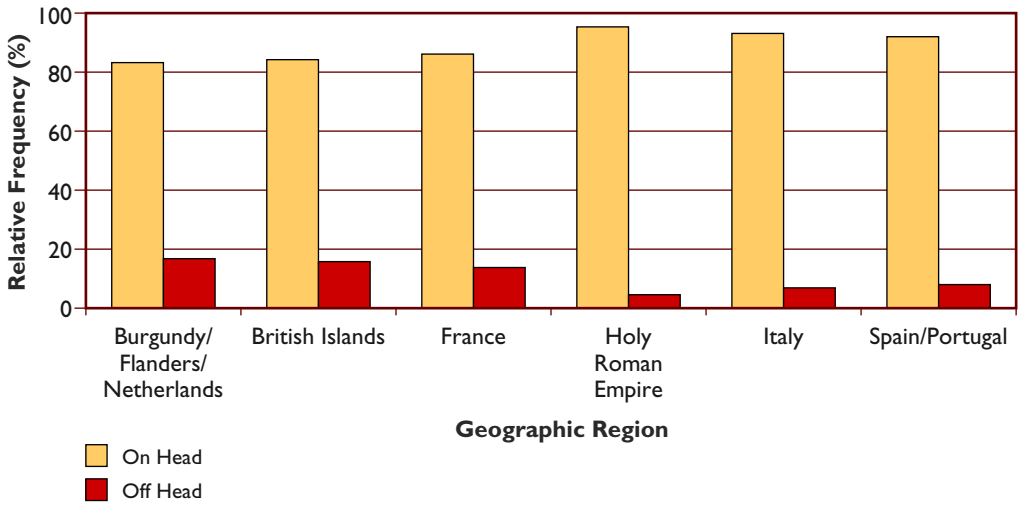

Figure 32
Relative Frequency of the Position of Headdress by Decade

Table 23. Relative Frequency of Multiple Headdress by Place of Origin

	BFN (%)	British Islands (%)	France (%)	HRE (%)	Italy (%)	Spain/ Portugal (%)	Overall (%)	N
Percentage of Multiple Headdress	27.3	28.6	22.1	25.7	9.5	25.0	22.4	177
N	209	70	145	109	158	100	791	
t-value	1.41	1.03	–0.08	0.69	–3.24	0.52		
Degrees of Freedom	208	69	144	108	157	99		
Significance	NS	NS	NS	NS	S	NS		

BFN Burgundy/Flanders/Netherlands HRE = Holy Roman Empire N = Number NS = Not significant S = Significant

Variations in the Height, Width, and Aspect Ratio Over Time

The physical measurements for each headdress varied with the sizes of the visual source in which it was portrayed. The height and width of each headdress for which those measurements could be made was normalized by dividing each of them by the face measurement or the distance from the chin to the bridge of the nose. This gave the height or width of the headdress as a proportion of the face and allowed comparison between headdresses. The aspect ratio of a headdress was calculated by dividing the height of the headdress by its width as described in Chapter III. Due to the

nature of some of the headdresses or to the nature of their portrayal, it was not possible to calculate height/face, width/face, or aspect ratios for every headdress. The sample size used for analysis of the height/face ratio was 610; the size for the width/face ration, 572; and for the aspect ratio, 584. Table 24 displays the means and the standard deviations for the height/face, width/face and aspect ratio for each decade. Figure 33 shows the mean values of each of these ratios. Analysis of variance (ANOVA) was used to test the null hypothesis that the means of these ratios for each decade did not vary significantly over time. Significant relationships were found between all three ratios and time.

An increase in the aspect ratio indicated an increase of height relative to the width of a headdress. After 1400 to 1449, the mean aspect ratios of headdress was centered around 0.423. In the 1450 to 1459 decade, there was a dramatic increase in aspect ratio. Mean aspect ratios continued to increase until the 1470 to 1479 decade after which there was an equally dramatic decline. By the 1510 to 1519 decade, the aspect ratio had fallen well below any earlier level.

Generally, height slowly decreased during the study period. From 1400 to 1479, the height/face ratio remained centered around 1.02, after which there was a slow decline.

Table 24. Dimensional Ratios by Decade

	Height/Face			Width/Face			Aspect Ratio		
	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
1400–1409	1.103	0.399	40	2.424	0.497	35	0.475	0.170	36
1410–1419	0.948	0.287	41	2.479	0.565	38	0.407	0.142	42
1420–1429	1.013	0.326	32	2.430	0.444	27	0.425	0.142	27
1430–1439	1.060	0.594	22	2.362	0.742	22	0.438	0.144	23
1440–1449	1.044	0.450	29	2.602	0.923	26	0.421	0.177	25
1450–1459	0.942	0.316	39	1.724	0.509	38	0.577	0.226	38
1460–1469	1.083	0.326	47	1.798	0.638	44	0.649	0.223	43
1470–1479	0.959	0.373	76	1.715	0.640	70	0.625	0.410	76
1480–1489	0.824	0.307	61	1.768	0.579	60	0.488	0.165	60
1490–1499	0.800	0.316	92	1.957	0.533	84	0.421	0.189	85
1500–1509	0.797	0.251	63	2.159	0.645	62	0.389	0.134	62
1510–1519	0.702	0.277	68	2.200	0.540	66	0.334	0.135	67
N			610			572			584
F-value			7.756			12.189			11.199
Degrees of Freedom			11/598			11/560			11/572
Probability			0.000			0.000			0.000

Std. Dev. = Standard deviation N = Number

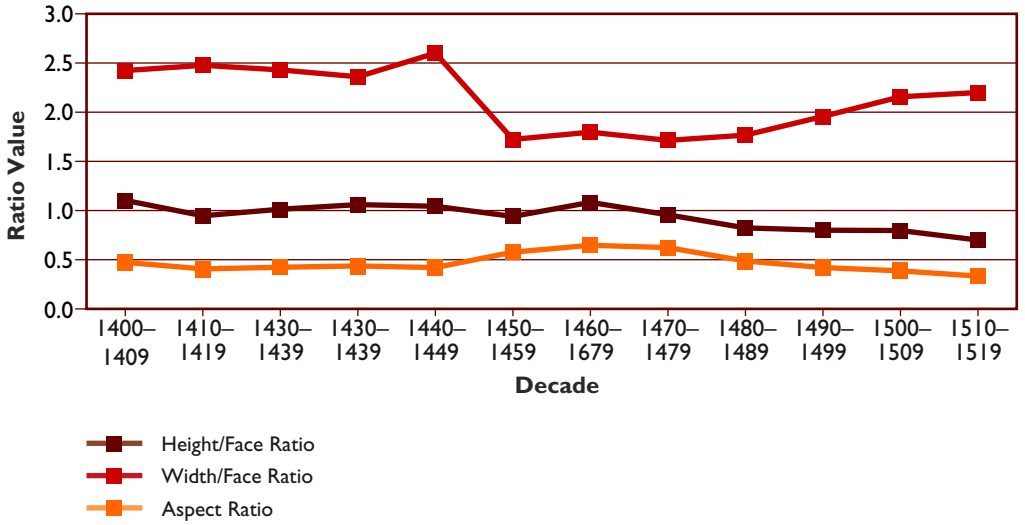

Figure 33
Dimensional Ratios by Decade

The width/face ratio, however had a strong decline between the 1440 to 1449 decade to the 1450 to 1459 decade. A lower level of width/face ratio was established from 1450 to 1489. This combined with a relatively steady height/face ratio produced the dramatic rise in aspect ratio from 1450 to 1479. A steady increase in the width/face ratio starting in 1490 combined with the steady decline in the height/face ratio at the same time produced the decline in the aspect ratio after the 1480 to 1489 decade. Prior to 1490, the changes in the aspect ratio of headdress seem to be attributed to the decrease of width of the headdress rather than an increase in height. After 1490, the effect of rising widths and lowering heights combined to create a declining aspect ratio.

Variations in the Height, Width, and Aspect Ratio by Place of Origin

Table 25 displays the means and the standard deviations for the height/face, width/face and aspect ratio for each place of origin. Figure 34 shows the means of these ratios for each place of origin. The sample size used for analysis of the height/face ratio was 610; the size for the width/face ration, 572; and for the aspect ratio, 584. Analysis of variance (ANOVA) was used to test the null hypothesis that the means of these ratios for each place of origin did not vary significantly by place of origin. A significant relationship was found between the aspect ratio and place of origin, but not for the height/face ratio or the width/face ratio.

Table 25. Dimensional Ratios by Place of Origin

	Height/Face			Width/Face			Aspect Ratio		
	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N
BFN	0.945	0.342	148	2.044	0.713	144	0.517	0.310	150
British Islands	0.921	0.332	50	2.224	0.694	46	0.451	0.226	44
France	0.940	0.334	116	2.058	0.598	113	0.484	0.224	116
HRE	0.812	0.341	88	2.143	0.599	85	0.393	0.169	87
Italy	0.907	0.413	128	2.004	0.712	116	0.467	0.190	118
Spain/Portugal	0.861	0.356	80	1.979	0.596	68	0.461	0.211	69
N			610			572			584
F-value			2.051			1.229			3.194
Degrees of Freedom			5/604			5/566			5/578
Probability			0.070			0.294			0.007

Std. Dev. = Standard deviation N = Number

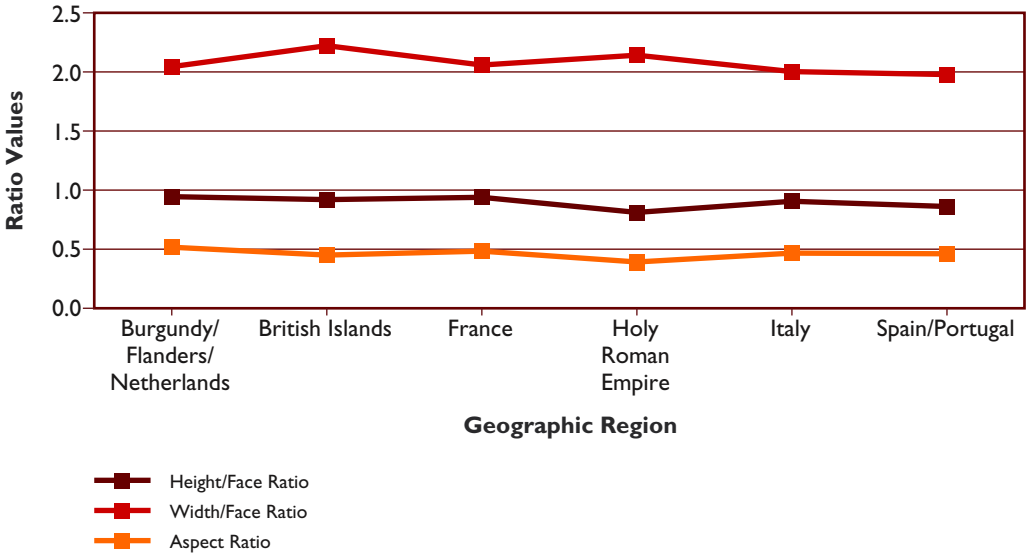

Figure 34
Dimensional Ratios by Place of Origin

A higher aspect ratio indicated greater height relative to the width of a headdress. Burgundy/Flanders/Netherlands had the highest aspect ratio, 0.517 which combined the largest height/face ratio with the second lowest width/face ratio, while the Holy Roman Empire had the lowest aspect ratio, 0.393, produced by the combination of the second highest width/face ratio and the lowest height/face ratio.

Variations in Interior/Exterior Use of Headdress by Type

Table 26 shows the relative frequencies of occurrence for whether the headdress was worn inside or outside for each headdress type. Since there were some cases in which the location of wear could not be determined, the sample size for this analysis was 719. Contingency analysis was used to test the null hypothesis that the relative frequency of whether a headdress was worn did not vary by headdress type. The data did allow for a collective test if some of the headdress types were combined. The categories for analysis were: acorn hats, combined stocking hats and sugarloaf hats, bonnets, cauls, chaperones, combined chaplets and rondelles, coifs, draped headdresses, hoods, sack hats, combined stiffened hats with flat hats. Figure 35 shows the relative frequencies of the location of headdress use by the headdress types used for analysis. The location of depicted use did vary significantly by headdress type ($\chi^2 = 23.77$, df = 10). Each of the headdress type categories were tested as well. Bonnets, sack hats, and combined stiffened hats and flat hats showed significant variations from the overall proportions.

Table 26. Relative Frequency of Interior or Exterior Wear of Headdress by Headdress Type

	Inside (%)	Outside (%)	Chi Squared	Degrees of Freedom	Significance	Number
Coif	53.3	46.7	0.400	1	NS	15
Hood	50.0	50.0	0.726	1	NS	78
Chaperone	51.0	49.0	1.36	1	NS	100
Sack Hat	28.0	72.0	8.96	1	S	75
Chaplet	57.1	42.9	0.39*	1	NS	7
Rondelle	50.0	50.0	*	*	*	6
Caul	30.8	69.2	1.09	1	NS	13
Acorn Hat	49.1	50.9	1.37*	1	NS	188
Sugarloaf Hat	60.0	40.0	*	*	*	10
Bonnet	57.9	42.1	6.18	1	S	95
Flat Hat	25.0	75.0	*	*	*	4
Stiffened Hat	32.0	68.0	9.37*	1	S	125
Stocking Hat	40.0	60.0	*	*	*	5
Draped Headdress	46.1	53.9	0.01	1	NS	13
Overall	45.2	54.8	23.77	10	S	719
Number	325	394				719

*The following categories were combined for contingency analysis: acorn hats/sugarloaf hats/stocking hats, chaplets/rondelles, and stiffened hats/flat hats. The chi squared values are given for the combined categories.

NS = Not significant S = Significant

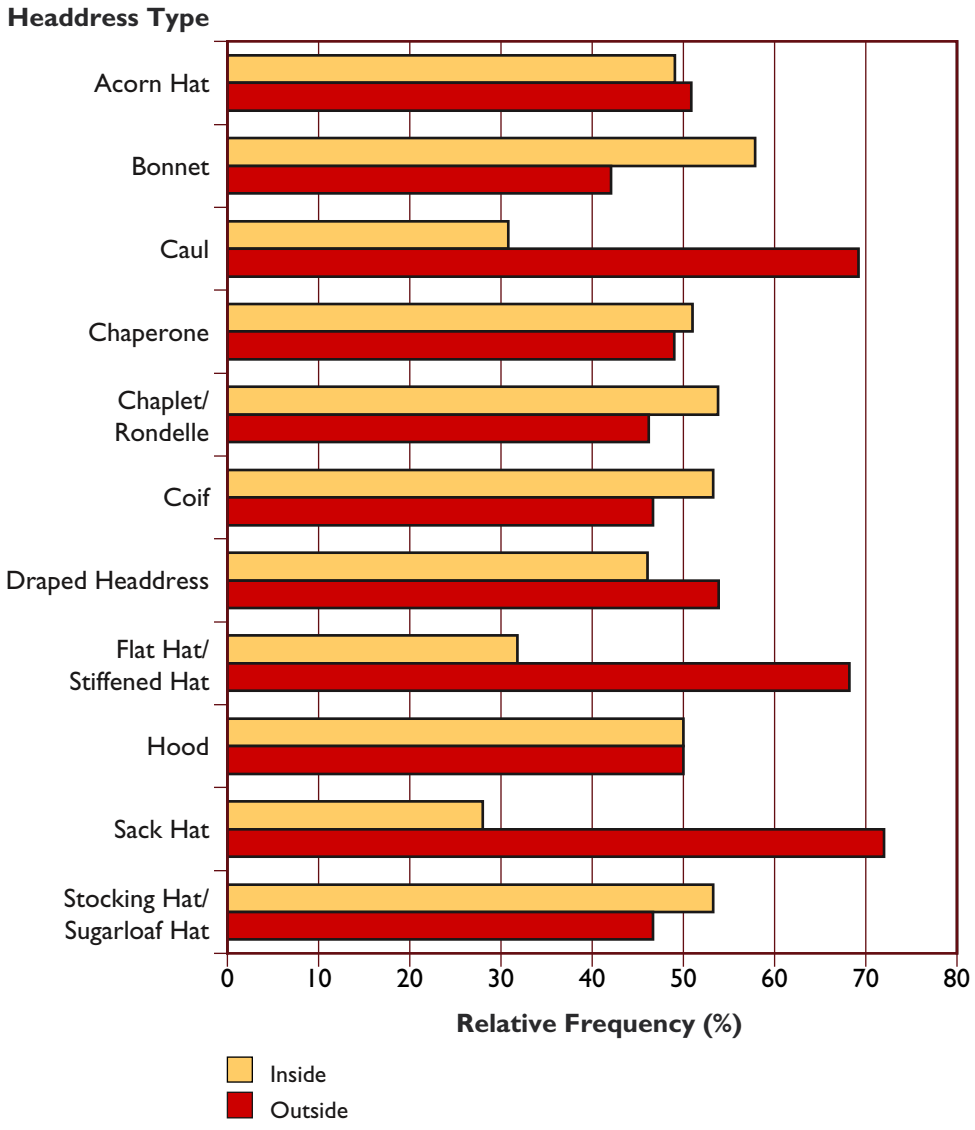

Figure 35
Interior or Exterior Wear of Headdress by Headdress Type

Variations in Headdress Type by Apparent Social Class

It should come to no surprise that the upper classes were depicted in visual arts far more frequently than the lower classes, as they were the patrons of the artists. The gentry and courtier/professional/official classes constituted 76.9% of all headdress wearers in the sample. This great varies with their proportions in fifteenth century

society. Denys Hay gave an estimate for the proportions of the nobility, gentry, and wealthy commoners each for Spain/Portugal and England in the fifteenth century. Spanish nobles and wealthy commoners were estimated to comprise no more than 1.14% of the population, while in England the estimate came to 1.7% of its population. Hay also postulated that the proportions were likely to be similar for the rest of western Europe. Clergy were also represented in art works in greater proportions than that class was found in fifteenth century society. Hay estimated that clergy numbered about 1.5% of the European population, but they represent 4.8% of the headdress wearers in the sample.[1]

Table 27 shows the relative frequencies of occurrence for the apparent social class or occupation of the wearers for each headdress type. Since there was one case in which the social class of the wearer could not be determined, the sample size for this analysis was 790. Contingency analysis was used to test the null hypothesis that the relative frequency of each headdress type for each apparent social class did not vary by social class. The data did allow for a collective test if some of the headdress types were combined. The categories for analysis were: combined acorn hats, stocking hats, and sugarloaf hats, bonnets, chaperones, hoods, sack hats, stiffened hats, and all others. Figure 36 shows the relative frequencies of the social classes of the wearers by the headdress types used for analysis. The location of depicted use did vary significantly by headdress type (χ^2 = 135.76, df = 24). Each of the headdress type categories were tested as well. In the cases of hoods, sack hats and all others, the category of clergy combined with the burgher/merchant category because neither of these two categories had expected values sufficiently high enough to conduct a contingency analysis. Combined acorn hats, stocking hats, and sugarloaf hats; bonnets, hoods, and stiffened hats showed significant variations from the overall proportions.

Members of the courtier/professional/official class wore disproportionately large numbers of acorn hats, but both the gentry and yeoman/artisan/laborer classes wore fewer acorn hats than expected. Bonnets were worn predominantly by the gentry class, while they fell short of expectation for the yeoman/artisan/laborer class. Although the burgher/merchant and clergy classes were combined for analysis for hoods, the expected value for the frequency of appearance of hoods for the clergy class was 4.8%, but the actual frequency was 19.0%. Clergy wore an unusually large number of hoods, but the courtier/professional/official class wore fewer than expected. Stiffened hats were worn disproportionately by the yeoman/artisan/laborer class, but again, they were not the favorite of the courtier/professional/official class.

[1]Denys Hay, Europe in the Fourteenth and Fifteenth Centuries, (New York: Holt, Rinehart and Winston, Inc.; 1966), 69 and 59.

Table 27. Relative Frequency of the Social Classes of the Wearers of Headdress by Headdress Type

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	Chi Squared	DF	Sig.	N
Acorn Hat	23.4	58.0	6.9	5.9	5.9	17.60*	4*	S*	188
Sugarloaf Hat	40.0	60.0	0.0	0.0	0.0	*	*	*	10
Stocking Hat	20.0	40.0	20.0	20.0	0.0	*	*	*	5
Bonnet	40.9	48.7	3.5	4.3	2.6	11.62	4	S	115
Chaperone	31.2	50.0	8.0	10.7	0.0	6.99	4	NS	112
Hood	25.9	32.1	2.5	16.0	23.5	22.24†	3	S†	81
Sack Hat	37.5	38.8	7.5	16.2	0.0	3.45†	3	NS†	80
Stiffened Hat	31.8	35.6	5.3	25.8	1.5	25.38	4	S	125
Other	38.8	37.3	7.5	11.9	4.5	2.13*†	3	NS*†	67
Coif	17.6	41.2	11.8	11.8	17.6	*	*	*	17
Chaplet	57.1	28.6	0.0	14.3	0.0	*	*	*	7
Rondelle	28.6	57.1	0.0	14.3	0.0	*	*	*	7
Caul	50.0	33.3	11.1	5.6	0.0	*	*	*	18
Flat Hat	66.7	33.3	0.0	0.0	0.0	*	*	*	6
Draped Headdress	33.3	33.3	8.3	25.0	0.0	*	*	*	12
Overall	31.6	45.3	5.9	12.3	4.8	135.76	24	S	790
N	250	358	47	97	38	790			

* Acorn hats, sugarloaf hats, and stocking hats were combined for contingency analysis as were coifs, chaplets, rondelles, cauls, flat hats and draped headdress. The chi squared values are given for the combined categories.

† Due to small sample sizes, burgher/merchant and clergy classes were combined for analysis for these cases.

DF = Degrees of freedom Sig. = Significance N = Number S = Significant NS = Not significant

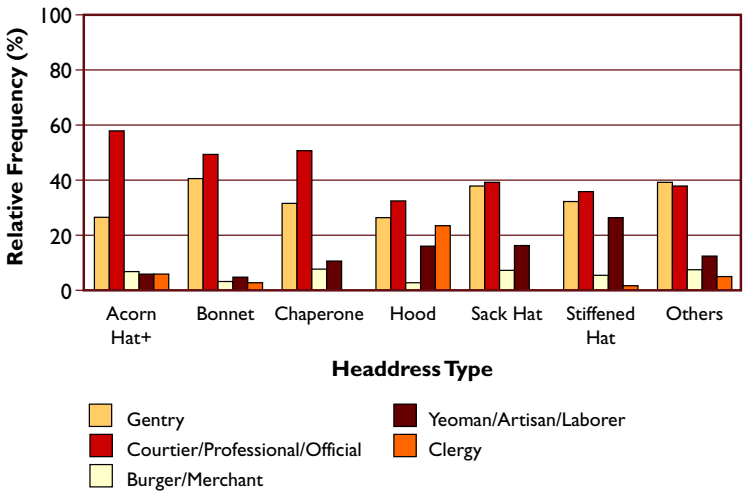

Figure 36
Relative Frequency of Apparent Social Class of Wearers of Headdress by Headdress Type

Dominant Characteristics of Individual Headdress Types

Acorn Hats

Since more than 83% of acorn hats were found from 1450 to 1499, and the remaining 17% scattered over the rest of the time period, the following analyses refer to acorn hats only from that period of time. Acorn hats were the predominant headdress type from 1450 to 1489 and one of the predominant headdresses of 1490 to 1499. They were also found to vary significantly by place of origin (χ^2 = 15.36, df = 5), and were more prevalent in Italy and Spain/Portugal and less prevalent in the British Islands and the Holy Roman Empire.

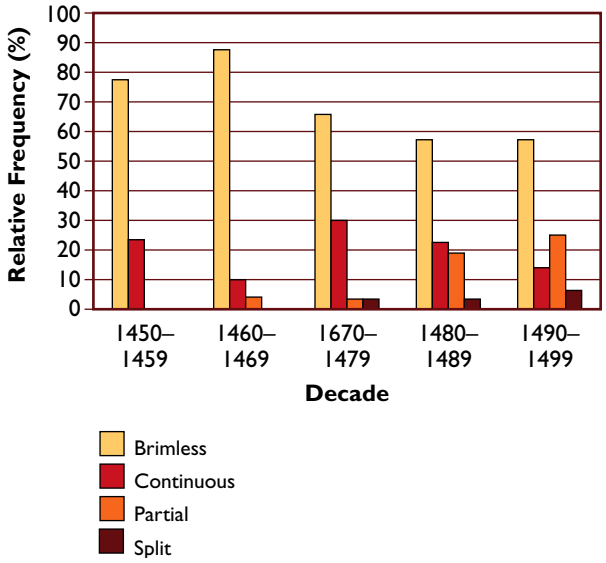

Figure 37
Relative Frequency of Brim Types for Acorn Hats Over Time

Acorn hats tended to be simple hats, brimless 67.3% of the time, and when they did have brims, they were usually continuous (19.2%) or partial (13.5%). Figure 37 displays the percentage of brim types used from 1450 to 1499. Although brimless hats predominated, the peak for brimless acorn hats was in the decade 1460 to 1469 and declined thereafter except for a slight increase for the 1490 to 1499 decade. Acorn hats with continuous brims peaked in the 1470 to 1479 decade. Partial brims were introduced in the 1460 to 1469 decade and split brims were introduced in the 1470 to 1479 decade. The overall trend towards increasing complexity of brim type did appear for acorn hats during this period as demonstrated by the rising proportion of higher-complexity brims. Acorn hats also often lacked applied ornamentation, appearing unadorned 89.7% of the time. The relative proportion of plain acorn hats did not vary significantly over time or by place of origin. For acorn hats, complexity increased with time were due to the adoption of more complex brim types rather than due to added decoration.

As with the headdresses in this study generally, the most popular colors for acorn hats were red and black. Red acorns hats of this period provided

45.5% of all acorn hats and black acorn hats provided 25.7% of all acorn hats. The use of red exceeded that of the sample as a whole while appearances of blue and a combined category of grey, green and yellow were less than expected based on the sample as a whole ($\chi^2 = 10.41$, df = 4). Table 28 shows the comparison of the distribution of color for both acorn hats and the sample overall. There were no significant variations in colors used over time or by place of origin.

The prevalent percentages of coverage of the hair-growing area were 50% to 75% from 1450 to 1479 and 25% to 50% from 1480 to 1489. Acorn headdresses did cover less of the head than did all the headdresses ($\chi^2 = 32.71$, df = 2). Fewer than expected acorn hats covered 75% of the hair growing area, while more than expected covered 50% or less. Table 29 shows the comparison of the distribution of coverage for both acorn hats and the sample overall. There were no significant variations in the percentage of coverage over time or by place of origin.

The ears were not covered by acorn hats of this period 83.3% of the time, partially covered 14.1% of the time and completely covered only 2.6% of the time. Acorn hats that did not cover the ears were found in proportions significantly higher than for all headdresses ($\chi^2 = 11.60$, df = 2) and acorn hats were less likely to cover the ears completely than other headdresses. Table 30 shows the comparison of the distribution of coverage for both acorn hats and the sample overall. Coverage of the ears did not deviate significantly over time. It did vary significantly by of origin if the categories of partially covered and completely covered were combined ($\chi^2 = 15.88$, df = 5). Acorn hats from the Holy Roman Empire and the British Islands more frequently covered the

Table 28. Distribution of Color Among Acorn Hats and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	Number
Acorn Hats	45.5	25.7	5.3	17.4	6.1	132
Overall	35.0	23.5	10.8	16.6	14.1	574

Table 29. Distribution of Coverage of the Hair-Growing Area Among Acorn Hats and All Headdress

	0% to 50% (%)	50% to 75% (%)	75% to 100% (%)	Number
Acorn Hats	37.9	49.0	13.1	119
Overall	22.4	46.3	31.2	695

Table 30. Distribution of Coverage of the Ears Among Acorn Hats and All Headdress

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	N
Acorn Hats	83.3	14.1	2.6	156
Overall	72.2	19.1	8.7	791

ears, either completely or partially, but acorn hats from Italy less frequently covered the ears.

Only three acorn hats were worn off of the head; these were carried in the hand. Acorn hats worn on the head constituted 98.1% of all acorn hats from 1450 to 1499 with only 1.9% were not being worn on the head. Acorn hats were overwhelmingly worn centered on the head. Table 31 shows the comparison of the distribution of the position of the headdresses for both acorn hats and the sample overall. Contingency analysis suggests that acorn hats were worn centered in greater proportions, and were worn tilted to the right and off of the head in smaller proportions than for the overall sample (χ^2 = 16.64, df = 3). There were no significant variations in the position of the hats used over time or by place of origin.

The mean aspect ratio for all acorn hats was 0.587. Mean aspect ratios of acorn hats for each decade varied significantly over time (F-value = 3.58; df = 11/154). Figure 38 shows the plot of aspect ratio of acorn hats and all headdress from 1450 to 1499. Except for the decade, 1440 to 1449, aspect ratios of the acorn hats were usually higher than for headdresses in general. The decades 1430 to 1439 and 1440 to 1449 had large deviations from the overall patterns. The sample size acorn hats for each of these decades was three, so the large deviations may be due to sampling error.

For place of origin, aspect ratios also varied significantly (F-value = 2.9; df = 5/160). Burgundy/Flanders/Netherlands and France had the highest aspect ratios wile the Holy Roman Empire had the lowest. The aspect ratios of acorn hats were higher than for headdresses in general, but followed

Table 31. Distribution of the Position of the Headdress Among Acorn Hats and All Headdress

	Centered (%)	Left (%)	Right (%)	Off Head (%)	N
Acorn Hats	92.9	3.2	1.9	1.9	156
Overall	81.2	3.4	3.9	11.5	791

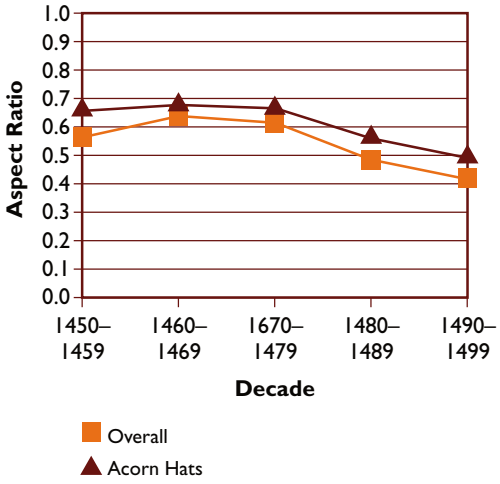

Figure 38
Aspect Ratios for Acorn Hats and All Headdress Over Time

the same general pattern except for the British Islands, which had the third highest aspect ratio for acorn hats, but the second lowest overall. Figure 39 shows a plot of mean aspect ratios by place of origin.

In general from 1450 to 1499, acorn hats were worn inside about 49.7% of the time and outside 50.3% of the time. There was no significant variation between these percentages and for the sample overall. Whether the acorn hat was worn inside or outside did vary significantly over time ($\chi^2 = 14.04$, df = 4). Figure 40 shows the proportions of acorn hats worn inside or outside. Acorn hats worn outside dominated from 1460 to 1489, but those worn inside dominated from 1450 to 1459 and 1490 to 1499. There also significant variations in the location of use by place of origin ($\chi^2 = 17.42$, df = 5). French acorn hats were more likely to be worn inside and acorn hats in the Holy Roman Empire were more likely to be worn outside.

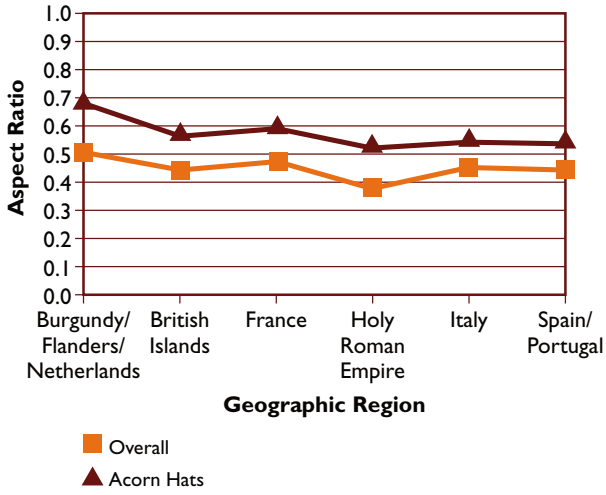

Figure 39
Aspect Ratios for Acorn Hats and All Headdress by Place of Origin

Previously it was noted that acorn hats were worn by the courtier/professional/official class in greater proportions than that class appeared in the sample and worn by the gentry and yeoman/artisan/laborer classes in smaller proportions than their classes appeared in the sample ($\chi^2 = 9.44$, df = 4). These proportions did not vary significantly over time or by place of origin. Table 32 displays the relative proportions of the social classes wearing acorn hats and wearing all headdress.

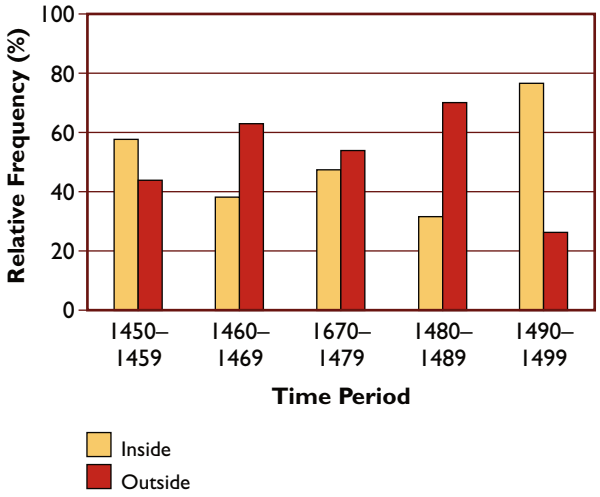

Figure 40
Relative Frequency of Interior/Exterior Usage of Acorn Hats Over Time

Bonnets

Bonnets were the predominant headdress type from 1500 to 1519 and one of the predominant headdresses of 1490 to 1499. Bonnets were more complex hats. They were also found to vary significantly by place of origin (χ^2 = 13.86, df = 5), and were more prevalent in Spain/Portugal and less prevalent in Burgundy/Flanders/Netherlands. As was observed before, the sample size for Burgundy/Flanders/Netherlands for the time period in which bonnets were present was especially small, so the low proportion of bonnets in Burgundy/Flanders/Netherlands may be due to sampling error.

Brimless bonnets only appeared 9.6% of the time. Brims were most ordinarily continuous (21.7%), partial (31.3%), or split (24.4%). Overlapping split brims appeared 13.0% of the time. The brim types of bonnets did not vary significantly over time. The spread of the data did not allow analysis of the distribution of brim type by place of origin. The only suggested trend in the data was that French bonnets seem to be more likely to have continuous or partial brims and less likely to have any other type of brim, and bonnets from the Holy Roman Empire had a disproportionate amount of overlapping split brims. Applied decoration on bonnets appeared about as frequently as for the sample as a whole, appearing unadorned 73.9% of the time. The relative proportion of plain bonnets did not vary significantly over time, but did by place of origin (χ^2 = 13.86, df = 5). Bonnets from Italy were more likely

Table 32. Distribution of Social Class Among Wearers of Acorn Hats and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Acorn Hats	23.4	58.0	6.9	5.9	5.9	188
Overall	31.6	45.3	5.9	12.3	4.8	791

CPO = Courtier/professional/official BM = Burgher/merchant YAL = Yeoman/artisan/laborer

to be decorated, and bonnets from the British Islands were more likely to be plain. When a bonnet was decorated, the most usual types of decoration were applied jewels, feathers, and laces or "points."

As with the headdresses in this study in general, the most popular colors for bonnets were red and black. Red was used for bonnets of this period 35.6% of the time and black was used 32.2%. The relative distribution of the colors for bonnets was not significantly different from the relative distribution of all headdresses. Table 33 shows the comparison of the distribution of color for both bonnets and the sample overall. Contingency analysis could only be done if the color categories were red, black, and others; no significant difference was found for color over time under these circumstances. The sample size for color was not large enough to make determinations of whether there were significant variations in color by place of origin.

The prevalent category of coverage of the hair-growing area for the bonnet was the 50% to 75% category comprising 57.3% of bonnets that covered the head with the 25% to 50% category being the next most frequently found percentage of coverage with 30.0%. Bonnets also covered less of the head than did all the headdresses ($\chi^2 = 20.56$, df = 2). Fewer than expected bonnets covered 75% or more of the hair growing area, while more than expected covered 50% or less. Table 34 shows the comparison of the distribution of coverage for both bonnets and the sample overall. There were no significant variations in percentage of coverage over time. The sample size for the bonnets was not large enough to make determinations of whether there were significant variations in color by place of origin.

Table 33. Distribution of Color Among Bonnets and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	N
Bonnets	34.4	31.1	3.3	11.5	19.7	61
Overall	35.0	23.5	10.8	16.6	14.1	574

Table 34. Distribution of Coverage of the Hair-Growing Area Among Bonnets and All Headdress

	0%–50% (%)	50%–75% (%)	75%–100% (%)	N
Bonnets	30.9	57.3	11.8	110
Overall	22.4	46.3	31.2	695

The ears were not covered by bonnets of this period 76.5% of the time, partially covered 21.7% of the time and completely covered only 1.7% of the time. Bonnets were less likely to cover the ears completely than other headdresses ($\chi^2 = 7.11$, df = 2). Table 35 shows the comparison of the distribution of coverage for both bonnets and the sample overall. Coverage of the ears did not deviate significantly over time or by place of origin.

Only four bonnets were worn off of the head; three of these were carried in the hand and the other was lying on the ground. Bonnets worn on the head for this period were 96.5% of all bonnets with only 3.5% were not being worn on the head. Although most bonnets were worn centered on the head, sizable proportions of them were worn tilted to one side or the other. Table 36 shows the comparison of the distribution of the position of the headdresses for both acorn hats and the sample overall. Contingency analysis suggests that bonnets were worn centered in smaller proportions, and were worn tilted to the right and off of the head in greater proportions than for the overall sample ($\chi^2 = 75.29$, df = 3). There were no significant variations in the position of the bonnets used over time or by place of origin.

The mean aspect ratio of bonnets overall was 0.343. Mean aspect ratios of bonnets for each decade varied significantly with time (F-value = 3.38; df = 4/94). Figure 41 shows a plot of the aspect ratios of bonnets and of all headdress over time. Except for the decade, 1480 to 1489, aspect ratios of the bonnets were usually lower than for headdresses in general. The aspect ratios for the decades 1440 to 1449 and

Table 35. Distribution of Coverage of the Ears Among Bonnets and All Headdress

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	N
Bonnets	76.5	21.7	1.7	115
Overall	72.2	19.1	8.7	791

Table 36. Distribution of the Position of the Headdress Among Bonnets and All Headdress

	Centered (%)	Left (%)	Right (%)	Off Head (%)	N
Bonnets	68.7	12.2	15.6	3.5	115
Overall	81.2	3.4	3.9	11.5	791

1480 to 1489 were similar to the overall aspect ratios for those decades. After 1490, the aspect ratio appears to level off at about 0.330. Mean aspect ratios did not vary significantly for place of origin.

In general, bonnets were worn inside about 57.3% of the time and outside 41.7% of the time. These percentages varied significantly from the sample overall ($\chi^2 = 4.30$, df = 1) with bonnets more likely to have been worn inside than for all headdresses as a whole. Whether the bonnet was worn inside or outside did vary significantly over time ($\chi^2 = 18.11$, df = 2). Figure 42 shows the proportions of bonnets worn inside or outside. Bonnets worn inside dominated from before 1500 and after 1509, but those worn outside dominated from 1500 to 1509. There also were no significant variations in the location of use by place of origin.

Bonnets were worn by the gentry class in greater proportions than that class appeared in the sample and worn by the yeoman/artisan/laborer classes in smaller proportions than that class appeared in the sample ($\chi^2 = 11.63$, df = 4). Table 37 displays the relative proportions of the social classes wearing bonnets and wearing all headdress. The distribution of bonnets by social class and decade and social class and place of origin was such that contingency analysis was not possible. It can be noted that bonnets first appear

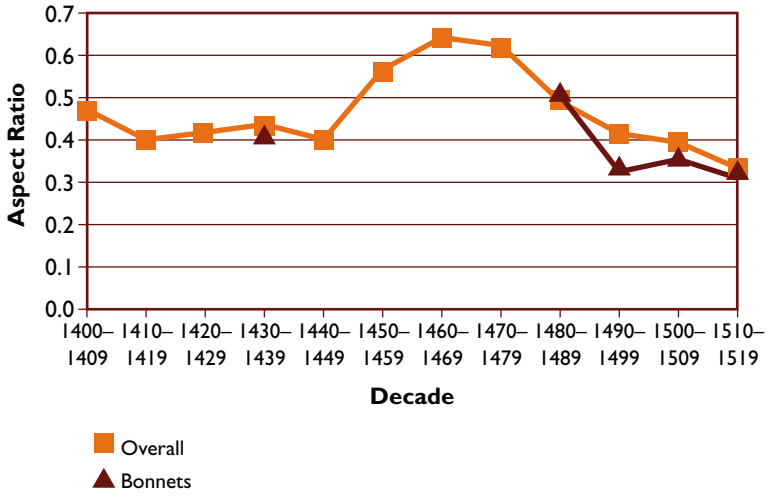

Figure 41
Aspect Ratios for Bonnets and All Headdress Over Time

worn by the gentry and courtier/professional/official classes in the 1440 to 1449 and 1480 to 1489 decade, and did not appear to be worn by the lower classes until the 1490 to 1499

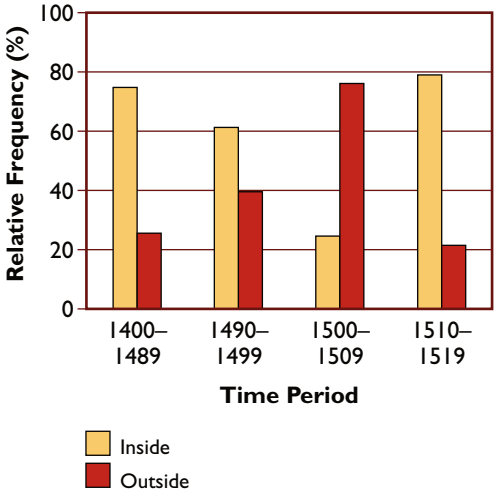

Figure 42
Relative Frequency of Interior/Exterior Usage of Bonnets Over Time

Table 37. Distribution of Social Class Among Wearers of Bonnets and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Bonnets	40.9	48.7	3.5	4.3	2.6	115
Overall	31.6	45.3	5.9	12.3	4.8	791

CPO = Courtier/professional/official BM = Burgher/merchant YAL = Yeoman/artisan/laborer

decade or worn by the clergy until the 1510 to 1519 decade.

Chaperones

Chaperones were one of the predominant headdresses from 1400 to 1429 and were found in every decade. They were also found to vary significantly by place of origin ($\chi^2 = 11.28$, df = 5), and were more prevalent in Burgundy/Flanders/Netherlands and the British Islands and less prevalent in Spain/Portugal and France.

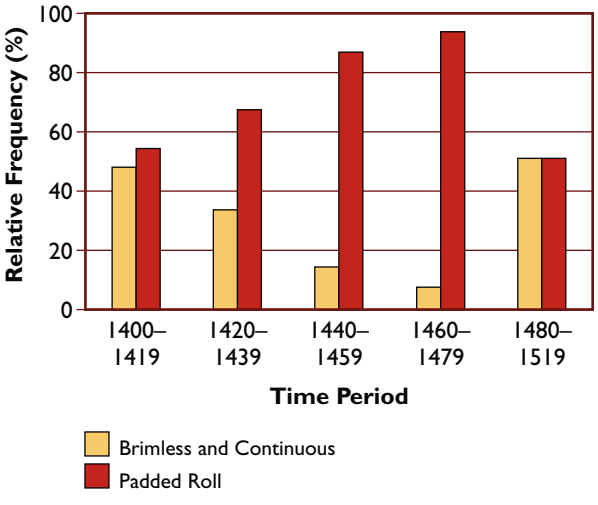

Figure 43
Relative Frequency of Brim Types for Chaperones Over Time

Padded or twisted roll brims were the predominant brim type (69.6%), with continuous brims as the next more common (25.9%). There were a few chaperones categorized as brimless as the shoulder capes obscured the brim so that no definite determination could be made. By combining decades for analysis, it was found that brim types of chaperones did vary significantly over time ($\chi^2 = 16.39$, df = 4). Continuous brims dominated from 1400 to 1409 and from 1500 to 1519, while padded roll brims dominated from 1410 to 1489. Figure 43 shows the relative frequency of brim types by the time categories used in analysis. Since chaperones were originally hoods worn sideways, it would make sense that the earlier chaperones would be more likely to have flat continuous brim. As the chaperone developed into a hat, a padded or stiffened ring would have better supported the shoulder cape and tippet and made the whole concoction easier to wear. The spread of the data did not allow analysis of the distribution of brim type by place of origin.

Applied decoration on chaperones appeared about as frequently as for the sample as a whole, appearing unadorned 75.0% of the time. The distribution of the data did not allow chaperones to be statistically analyzed for relationship over time or by place of origin. When a chaperone was

decorated, the most usual types of decoration were applied jewels and dagging.

The most popular colors for chaperones were red, black, and blue. Red was used for chaperones 41.6% of the time, black was used 23.4% of the time, and blue was used 18.2%. The relative frequency of appearance of red and blue was greater than expected based on the sample as a whole. The relative distribution of the colors for chaperones was slightly significantly different from the relative distribution of all headdresses ($\chi^2 = 9.79$, df = 4). Table 38 shows the comparison of the distribution of color for both chaperones and the sample overall. The colors were distributed in such a way that contingency analysis could not be done to test the relationships of color with time or by place of origin. However, the use of blue in chaperones discontinued after 1439.

The prevalent category of coverage of the hair-growing area for the chaperone was the 75% to 100% category comprising 51.6% of chaperones that covered the head with the 50% to 75% category being the next most frequently found percentage of coverage with 46.2%. Chaperones tended to cover 75% to 100% of the head in proportions greater than found for all headdresses ($\chi^2 = 18.7$, df = 1). Table 39 shows the comparison of the distribution of coverage for both chaperones and the sample overall. Although the 50% to 75% category had to be combined with the 0% to 25% and the 25% to 50% categories for analysis, it is obvious from Table 39 that fewer than expected chaperones covered less than 50% of the hair growing area while the relative frequency of chaperones in the 50% to 75% category was close to the expected relative frequency. By combining decades, it was found that the coverage of the head did vary significantly with time ($\chi^2 = 21.68$, df = 4). The 75% to 100% category

Table 38. Distribution of Color Among Chaperones and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	N
Chaperones	41.6	23.4	18.2	9.1	7.8	77
Overall	35.0	23.5	10.8	16.6	14.1	574

Table 39. Distribution of Coverage of the Hair-Growing Area Among Chaperones and All Headdress

	0%–50% (%)	50%–75% (%)	75%–100% (%)	N
Chaperones	2.2	46.2	51.6	93
Overall	22.4	46.3	31.2	695

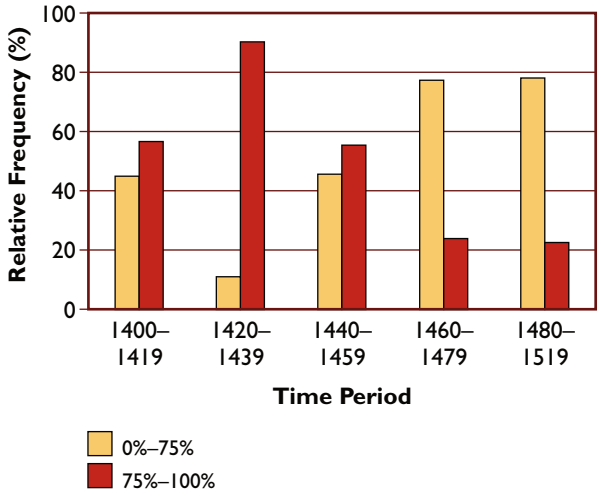

Figure 44
Relative Frequency of Coverage of the Hair-growing Area by Chaperones Over Time

predominated from 1400 to 1459 and from 1510 to 1519 while the 50% to 75% category dominated from 1460 to 1499. Figure 44 shows the relative frequency of coverage categories by the time categories used in analysis. The coverage of the head did not vary significantly by place of origin.

The ears were not covered by chaperones of this period 66.1% of the time, partially covered 30.4% of the time and completely covered only 3.6% of the time. Chaperones were more likely to cover the ears partially than other headdresses (χ^2 = 11.36, df = 2). Table 40 shows the comparison of the distribution of coverage for both chaperones and the sample overall. By combining decades, it was found that the coverage of the ears did vary significantly with time (χ^2 = 21.08, df = 4). Chaperones that partially covered ears dominated from 1400 to 1419 while chaperones that did not cover the ears dominated from 1440 to 1519. Figure 45 shows the relative frequency of coverage of the ears categories by the time categories used in analysis. The sample sizes for each place of origin was not large enough to make determinations of whether there were significant variations in the distribution of the coverage of ears by place of origin.

Nineteen chaperones were worn off of the head; seventeen of these were suspended over the shoulder and two were carried in the hand. Chaperones worn on the head for this period constituted 83.0% of all chaperones with 17.0% of chaperones not being worn on the head. Most chaperones were worn centered

Table 40. Distribution of Coverage of the Ears Among Chaperones and All Headdress

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	N
Chaperones	66.1	30.4	3.6	112
Overall	72.2	19.1	8.7	791

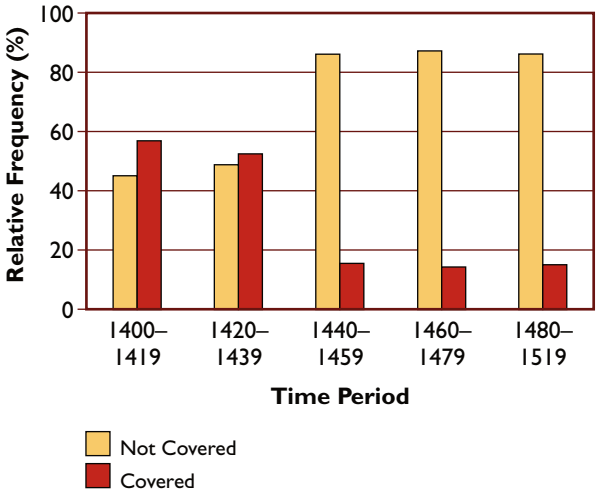

Figure 45
Relative Frequency of the Coverage of the Ears by Chaperones Over Time

on the head, with only a two being worn tilted to the right. Table 41 shows the comparison of the distribution of the position of the headdresses for both acorn hats and the sample overall. There was no significant variations of the proportions of hats worn on the head and off of the head between chaperones and all headdress. The distribution of the chaperones for the position of the headdresses was not adequate enough to make determinations of whether there were significant variations in the distribution of the position of the hats over time or by place of origin.

The mean aspect ratio of chaperones overall was 0.384. Mean aspect ratios of chaperones for each decade did not vary significantly with time or for place of origin.

In general, chaperones were worn inside about 51.0% of the time and outside 49.0% of the time. These percentages did not vary significantly from the sample overall. Whether the chaperone was worn inside or outside varied significantly over time if decades were combined ($\chi^2 = 12.72$, df = 5). Figure 46 shows the relative frequency of the location of wear by the time categories used in analysis. Outside wear was found more frequently than expected for the period 1420 to 1439 and inside wear was found more frequently than expected for the periods 1440 to 1459 and 1480 to 1499. The sample size for each of the places of origin was not large enough to make determinations of whether there were significant variations in the distribution of the position of the hats by place of origin.

Chaperones were distributed by social class in proportions that did

Table 41. Distribution of the Position of the Headdress Among Chaperones and All Headdress

	Centered (%)	Left (%)	Right (%)	Off Head (%)	N
Chaperones	82.6	2.3	1.5	13.7	112
Overall	81.2	3.4	3.9	11.5	791

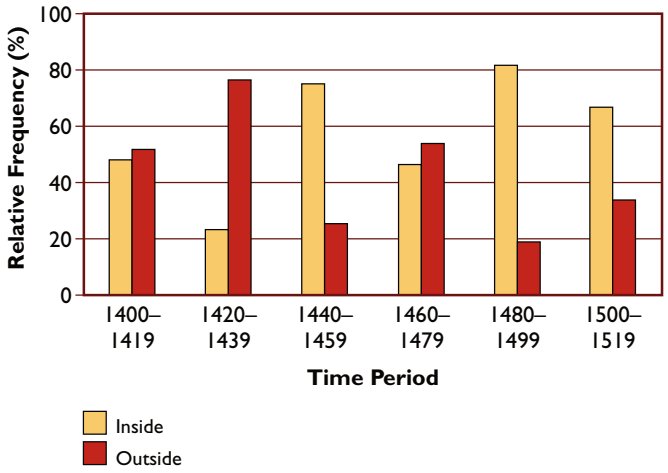

Figure 46
Relative Frequency of Interior/Exterior Usage of Chaperones Over Time

not vary significantly for the overall distribution of headdresses by social class. Table 42 displays the relative proportions of the social classes wearing chaperones and wearing all headdress. It should be noted that no one who could be identified as clergy worn chaperones. The distribution of chaperones by social class and decade and social class and place of origin was such that contingency analysis was not possible. However, there were no members of the gentry represented wearing chaperones in the Holy Roman Empire and no members of the courtier/professional/official class represented wearing chaperones in Spain/Portugal.

Hoods

Hoods were one of the predominant headdress types from 1400 to 1419 and from 1440 to 1449 and were found in every decade. They were not found to vary significantly by place of origin.

Hoods were categorically defined as having no brim. Applied decoration on hoods appeared significantly more frequently than for the sample as a whole, with 38.3% of hoods being decorated as compared to 25.4% of all headdresses ($\chi^2 = 7.04$, df = 1). Contingency analysis for the distribution of hoods over time could only be accomplished by combining two or more of the decades together. After doing so, no significant variation was found for hoods over time. Since place of origin categories could not be logically combined, contingency analysis could not be performed for the distribution of hoods by place of origin. However, the proportions of plain and decorated hoods for each location did not seem to vary greatly from the overall proportions

Table 42. Distribution of Social Class Among Wearers of Chaperones and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Chaperones	31.2	50.0	8.0	10.7	0.0	112
Overall	31.6	45.3	5.9	12.3	4.8	791

of plain and decorated hoods. When a hood was decorated, the most usual types of decoration were dagging (54.8% of decorated hoods) and cording or applied bands of trim (19.0%)

The most popular colors for hoods were red, blue, brown, and white. Red was used for hoods of this period 30.3%, blue was used 19.7%, and the combined category of brown/white was used 22.7% of the time. The relative distribution of the colors for hoods were significantly different from the relative distribution of all headdresses ($\chi^2 = 10.70$, df = 4). Black was found less often and blue and brown/white were found more often for hoods than for all headdresses. Table 43 shows the comparison of the distribution of color for both hoods and the sample overall. The sample size for color was not large enough to make determinations of whether there were significant variations in color over time or by place of origin.

The coverage of the head and of the ears by the hood depended on how it was worn. When the hood was worn up, the coverage of the head was almost always 75% to 100% and the ears were always completely covered. When it was worn down, the coverage of the head was coded "not applicable," and the ears were not covered. Only two hoods worn on the head had coverages other than 75% to 100%; these were worn pushed to the back of the head, but not onto the shoulder.

The nature of the hood made it nearly impossible to tilt in any direction, so when it was worn on the head, it was always worn centered. When worn off of the head, it was always pushed onto the shoulders. Hoods were worn on the head 44.4% of the time and off of the head 55.6% of the time. Contingency analysis suggests that hoods were worn on the head in smaller proportions, and were worn off of the head in greater proportions than for the overall

Table 43. Distribution of Color Among Hoods and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	N
Hoods	30.3	12.1	19.7	22.7	15.2	67
Overall	35.0	23.5	10.8	16.6	14.1	574

Table 44. Distribution of the Position of the Headdress Among Hoods and All Headdress

	On Head (%)	Off Head (%)	N
Hoods	44.4	55.6	81
Overall	88.5	11.5	791

sample ($\chi^2 = 152.5$, df = 1). Table 44 shows the comparison of the distribution of position of the headdress for both hoods and the sample overall. There were no significant variations in the position of the hoods used over time or by place of origin.

Since hoods conformed to the shape of the head, there was no measurable height or width of the headdress in comparison to the head and, consequently, no aspect ratio.

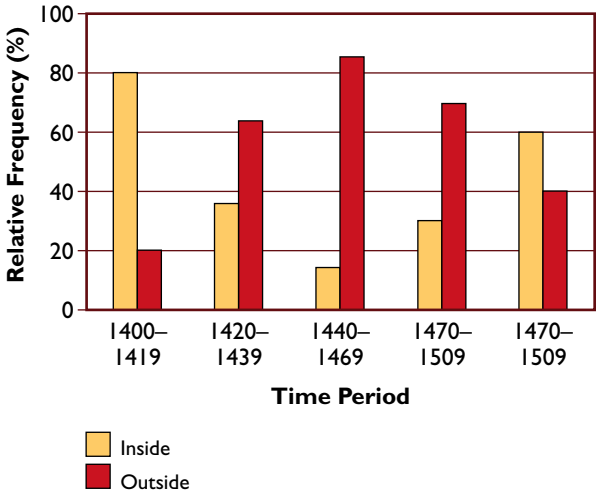

Figure 47
Relative Frequency of Interior/Exterior Usage of Hoods Over Time

In general, hoods were worn inside 50.0% of the time and outside 50.0% of the time. These percentages did not vary significantly from the sample overall. Whether the hood was worn inside or outside did vary significantly over time ($\chi^2 = 20.77$, df = 4). Figure 47 shows the proportions of hoods worn inside or outside. Hoods worn inside dominated from before 1420 and after 1469, but those worn outside dominated from 1420 to 1469. Whether there were significant variations in the location of use by place of origin could not be determined because of the particular distribution of the sample.

Although the burgher/merchant and clergy classes were combined for analysis of the hoods, the expected value for the frequency of appearance of hoods for the clergy class was 4.8%, but the actual frequency was 23.5%. Clergy wore an unusually large number of hoods, but the courtier/professional/official class wore fewer than expected ($\chi^2 = 22.24$, df = 3). Table 45 displays the relative proportions of

Table 45. Distribution of Social Class Among Wearers of Hoods and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Hoods	25.9	32.1	2.5	16.0	23.5	115
Overall	31.6	45.3	5.9	12.3	4.8	791

CPO = Courtier/professional/official BM = Burgher/merchant YAL = Yeoman/artisan/laborer

the social classes wearing hoods and wearing all headdress. The distribution of hoods by social class and decade and social class and place of origin was such that contingency analysis was not possible. Clergy wearing hoods were concentrated in Italy, where 76.9% of the hoods worn by clergy were found.

Sack Hats

Sack hats were a variant form of chaperone in which the shoulder cape has been converted to a sack-shaped crown. Sack hats were one of the predominant headdresses from 1400 to 1429 and were found in every decade except 1510 to 1510. They were also found to vary significantly by place of origin ($\chi^2 = 11.28$, df = 5), and were more prevalent in Italy and the British Islands and less prevalent in Burgundy/Flanders/Netherlands.

Padded or twisted roll brims were the predominant brim type (61.2%), with continuous brims as the next more common (26.2%). There was one sack hat categorized as brimless as the crown obscured the brim so that no definite determination could be made, and two examples of split brims were found. Sack hats were the only hat style in which multiple brims could be found; there were seven examples of these. By combining decades for analysis, it was found that brim types of sack hats did vary significantly over time ($\chi^2 = 16.65$, df = 3). Continuous brims were combined with brimless, split, and multiple-brim types. This combined category dominated from 1440 to 1469, while padded roll brims dominated from 1400 to 1439 and from 1470 to 1509. Figure 48 shows the relative frequency of brim types by the time categories used in analysis. The spread of the data did not allow analysis of the distribution of brim type by place of origin. The Holy Roman Empire and Italy were the only places of origin to have sack hats with multiple brims, and Italy was the only place of origin in which continuous brims were more prevalent than padded or twisted roll brims.

Applied decoration on sack hats appeared about as frequently as for the sample as a whole, appearing unadorned 81.2% of the time. By combining decades, it was found that decoration status of sack did vary

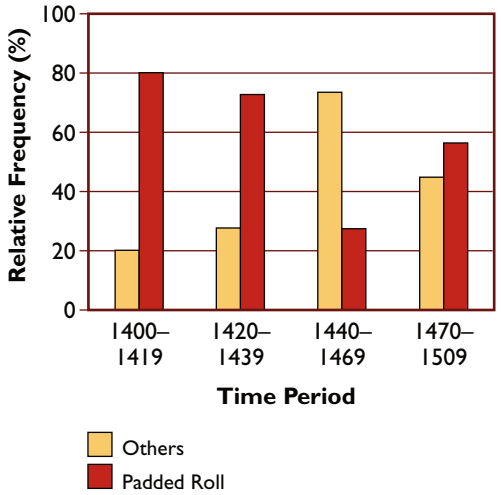

Figure 48
Relative Frequency of Brim Types for Sack Hats Over Time

significantly over time ($\chi^2 = 6.84$, df = 2) Figure 49 shows the relative frequency of decoration by the time categories used in analysis. Generally, the tendency for decorated sack hats decreased over time, and the tendency for plain sack hats increased. The distribution of the data did not allow sack hats to be statistically analyzed for relationship over time or by place of origin. When a sack hat was decorated, the most usual type of decoration were applied jewels.

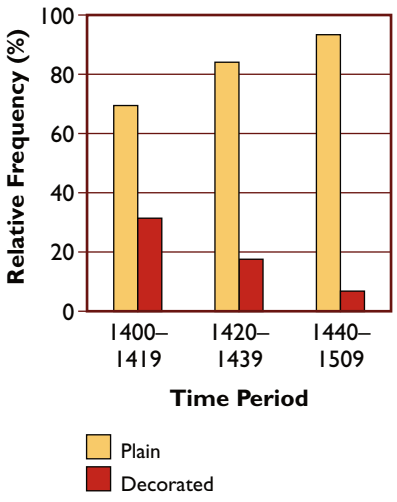

Figure 49
Relative Frequency of the Appearance of Decoration for Sack Hats Over Time

The most popular colors for sack hats were red and blue. Red was used for sack hats 49.2% of the time and blue was used 15.4%. The relative frequency of appearance of red and blue was greater than expected based on the sample as a whole. The relative distribution of the colors for sack hats was significantly different from the relative distribution of all headdresses ($\chi^2 = 10.97$, df = 4). Table 46 shows the comparison of the distribution of color for both sack hats and the sample overall. Red and blue were found in unexpectedly high proportions, while black and brown/white were found unexpectedly low proportions. The colors were distributed in such a way that contingency analysis could not be done to test the relationships of color with time or by place of origin.

The prevalent category of coverage of the hair-growing area for the sack hat was the 50% to 75% category comprising 49.3% of sack hats that covered the head with the 75% to 100% category being the next most frequently found percentage of coverage with 44.5%. Sack hats were more likely to cover 75% to 100% of the head than would all headdress types combined ($\chi^2 = 13.0$, df = 2). Fewer than expected sack hats covered

Table 46. Distribution of Color Among Sack Hats and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	N
Sack Hats	49.2	10.8	15.4	10.8	13.8	65
Overall	35.0	23.5	10.8	16.6	14.1	574

less than 50% of the hair growing area, but the relative frequency of sack hats in the 50% to 75% category was close to the expected relative frequency. Table 47 shows the distribution of coverage for both sack hats and the sample overall. By combining decades, it was found that the coverage of the head did vary significantly with time ($\chi^2 = 17.52$, df = 3). The 75% to 100% category dominated from 1400 to 1439, while the 50% to 75% category dominated from 1440 to 1509. Figure 50 shows the relative frequency of coverage categories by the time categories used in analysis. The coverage of the head was distributed in such a way that contingency analysis could not be done to test the relationships of color by place of origin.

The ears were not covered by sack hats of this period 75.0% of the time, partially covered 22.5% of the time and completely covered only 2.5% of the time. Coverage of ears by sack hats did not vary significantly from the coverage of the ears by all headdress. Table 48 shows the comparison of the distribution of coverage for both sack hats and the sample overall. By combining decades, it was found that the coverage of the ears did vary significantly with time ($\chi^2 = 10.19$, df = 2). Sack hats that did not cover the ears dominated

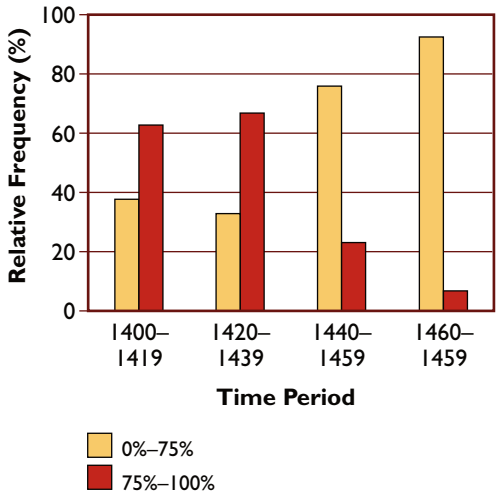

Figure 50
Relative Frequency of the Coverage of the Hair-growing Area by Sack Hats Over Time

Table 47. Distribution of Coverage of the Hair-Growing Area Among Sack Hats and All Headdress

	0%–50% (%)	50%–75% (%)	75%–100% (%)	N
Sack Hats	6.5	49.3	44.2	77
Overall	22.4	46.3	31.2	695

Table 48. Distribution of Coverage of the Ears Among Sack Hats and All Headdress

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	N
Sack Hats	75.0	22.5	2.5	80
Overall	72.2	19.1	8.7	791

from 1400 to 1509 but the relative frequency of sack hats that covered the ears entirely or in part diminished with time. Figure 51 shows the relative frequency of coverage of the ears categories by the time categories used in analysis. The sample sizes for each place of origin was not large enough to make determinations of whether there were significant variations in the distribution of the coverage of ears by place of origin.

Only two sack hats were worn off of the head and these were carried in the hand. Sack hats worn on the head for this period constituted 97.5% of all sack hats with 2.5% were not being worn on the head. Most sack hats were worn centered on the head, with only three being worn tilted to one or the other side. There was a significant variation of the proportions of hats worn on the head and off of the head between sack hats and all headdress ($\chi^2 = 6.37$, df = 1). Table 49 shows the comparison of the distribution of the position of the headdresses for both acorn hats and the sample overall. The distribution of the sack hats for the position of the headdresses was not adequate enough to make determinations of whether there were significant variations in the distribution of the position of the hats over time or by place of origin.

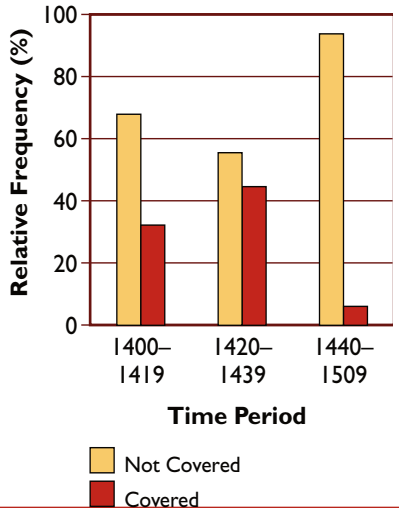

Figure 51
Relative Frequency of the Coverage of the Ears by Sack Hats Over Time

The mean aspect ratio of sack hats overall was 0.509. Mean aspect ratios of sack hats for each decade did not vary significantly with time, but did vary significantly by place of origin (F-value = 2.449, df = 5/65). Italy had the highest mean aspect ratio, 0.600, while Spain/Portugal had the lowest, 0.406. Table 50 gives the mean aspect ratio for each place of origin.

Table 49. Distribution of the Position of the Headdress Among Sack Hats and All Headdress

	Centered (%)	Left (%)	Right (%)	Off Head (%)	N
Sack Hats	93.8	2.5	1.2	2.5	80
Overall	81.2	3.4	3.9	11.5	791

Table 50. Mean Aspect Ratio of Sack Hats for Each Place of Origin

	Mean	Standard Deviation	N
Italy	0.600	0.211	20
France	0.539	0.128	11
Holy Roman Empire	0.491	0.172	12
Burgundy/Flanders/Netherlands	0.465	0.140	11
British Islands	0.437	0.126	10
Spain/Portugal	0.406	0.100	7
Overall	0.508	0.172	71

In general, sack hats were worn outside about 72.0% of the time and outside 28.0% of the time. These percentages did vary significantly from the sample overall ($\chi^2 = 8.96$, df = 1). Whether the sack hat was worn inside or outside did not vary significantly over time. The sample size for each of the places of origin was not large enough to make determinations of whether there were significant variations in the distribution of the location of wear the hats by place of origin. However, sack hats worn indoors predominate in the Holy Roman Empire, and no hats worn indoors appeared in the British Islands.

Sack hats were distributed by social class in proportions that did not vary significantly for the overall distribution of headdresses by social class. Table 51 displays the relative proportions of the social classes wearing sack hats and wearing all headdress. It should be noted that no one who could be identified as clergy wore sack hats. The distribution of sack hats by social class and decade and social class and place of origin was such that contingency analysis was not possible. However, there were no members of the burgher/merchant or yeoman/artisan/laborer classes represented wearing sack hats in the British Islands and members of the burgher/merchant class represented wearing sack hats in Spain/Portugal exceeded the number

Table 51. Distribution of Social Class Among Wearers of Sack Hats and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Sack Hats	37.5	38.8	7.5	16.2	0.0	80
Overall	31.6	45.3	5.9	12.3	4.8	791

CPO = Courtier/professional/official BM = Burgher/merchant YAL = Yeoman/artisan/laborer

of members of the gentry and the courtier/professional/official class.

Stiffened Hats

Stiffened hats were one of the predominant headdress from 1470 to 1489. They were also found to vary significantly by place of origin ($\chi^2 = 13.69$, df = 5), and were more prevalent in Burgundy/Flanders/Netherlands and less prevalent in Spain/Portugal, and the British Islands.

Brimless stiffened hats only appeared 4.5% of the time. Brims were most ordinarily rolled (43.2%), Robin Hood (28.0%), or continuous (17.4%). Split or overlapping split brims appeared 6.9% of the time. The brim types of stiffened hats did not vary significantly over time. The spread of the data did not allow analysis of the distribution of brim type by place of origin. Although a larger sample size was needed, the data suggests that continuous, split, and brimless hats seemed more popular in Italy and Spain/Portugal and less popular in France and the British Islands. Rolled brims were found in the British Islands and France in higher than usual proportions, but were not found as frequently in the Holy Roman Empire, Italy, or Spain/Portugal. Finally, Robin Hood brims seemed to be concentrated in the Holy Roman Empire. Applied decoration on stiffened hats appeared about as frequently as for the sample as a whole, appearing unadorned 69.7% of the time.

The relative proportion of plain stiffened hats did not vary significantly over time. The distribution of the data did not allow stiffened hats to be statistically analyzed for relationship by place of origin, but the data suggests that plain stiffened hats seemed to be strongly preferred in Burgundy/Flanders/Netherlands, the British Islands, and the Holy Roman Empire, but stiffened hats in Italy and Spain/Portugal were less likely to be undecorated. When a stiffened hat was decorated, the most usual types of decoration were applied jewels, feathers, and hat bands.

The most popular colors for stiffened hats were black, red, brown, and white. Black was used for stiffened hats 33.3% of the time, red was used 18.0% of the time, and brown and white, combined, were used 19.8%. The relative frequency of appearance of red was less than expected based on the sample as a whole. The relative distribution of the colors for stiffened hats was significantly different from the relative distribution of all headdresses ($\chi^2 = 15.27$, df = 4). Table 52 shows the comparison of the distribution of color for both stiffened hats and the sample overall. The colors were distributed in such a way that contingency analysis could not be done to test the relationships of color with time or by place of origin.

The prevalent category of coverage of the hair-growing area for the stiffened hat was the 50% to 75% category comprising 62.5% of stiffened hats that

Table 52. Distribution of Color Among Stiffened Hats and All Headdress

	Red (%)	Black (%)	Blue (%)	Brown/ White (%)	Others (%)	N
Stiffened Hats	18.0	33.3	11.7	19.8	17.1	111
Overall	35.0	23.5	10.8	16.6	14.1	575

covered the head with the 75% to 100% category being the next most frequently found percentage of coverage with 19.6%. Stiffened hats tended to cover 50% to 75% of the head in proportions greater than found for all headdresses ($\chi^2 = 46.36$, df = 2). Fewer than expected stiffened hats covered 75% or more or less than 50% of the hair growing area. Table 53 shows the comparison of the distribution of coverage for both stiffened hats and the sample overall. There were no significant variations in percentage of coverage over time. The sample size for the stiffened hats was not large enough to make determinations of whether there were significant variations in coverage of the hair growing areas by place of origin.

The ears were not covered by stiffened hats of this period 77.2% of the time, partially covered 20.5% of the time and completely covered only 2.3% of the time. Stiffened hats were less likely to cover the ears completely than other headdresses ($\chi^2 = 6.75$, df = 2). Table 54 shows the comparison of the distribution of coverage for both stiffened hats and the sample overall. Coverage of the ears did not deviate significantly over time. The sample size for the stiffened hats was not large enough to make determinations of whether there were significant variations in the distribution of the coverage of ears by place of origin.

Eighteen stiffened hats were worn off of the head; ten of these were carried

Table 53. Distribution of Coverage of the Hair-Growing Area Among Stiffened Hats and All Headdress

	0%–50% (%)	50%–75% (%)	75%–100% (%)	N
Stiffened Hats	17.9	62.5	19.6	112
Overall	22.4	46.3	31.2	695

Table 54. Distribution of Coverage of the Ears Among Stiffened Hats and All Headdress

	Not Covered (%)	Partially Covered (%)	Completely Covered (%)	N
Stiffened Hats	77.2	20.5	2.3	132
Overall	72.2	19.1	8.7	791

in the hand, three were lying on the ground, and five were suspended over the shoulder. Stiffened hats worn on the head for this period constituted 86.4% of all stiffened hats with 13.7% were not being worn on the head. Most stiffened hats were worn centered on the head, with only a few being worn tilted to one side or the other. Table 55 shows the comparison of the distribution of the position of the headdresses for both acorn hats and the sample overall. There were no significant variations of the proportions of hats worn on the head and off of the head between stiffened hats and all headdress. There were no significant variations in the position of the stiffened hats used over time. The sample size for the stiffened hats was not large enough to make determinations of whether there were significant variations in the distribution of the position of the hats by place of origin.

The mean aspect ratio of stiffened hats overall was 0.421. Mean aspect ratios of stiffened hats for each decade did not vary significantly with time or for place of origin.

In general, stiffened hats were worn inside about 32.0% of the time and outside 68.0% of the time. These percentages varied significantly from the sample overall ($\chi^2 = 8.79$, df = 1) with stiffened hats more likely to have been worn outside than for all headdresses as a whole. Whether the stiffened hat was worn inside or outside did not vary significantly over time. The sample size for the stiffened hats was not large enough to make determinations of whether there were significant variations in the distribution of the hat position by place of origin. The samples sizes for particular places of origin did permit contingency analysis and in both Italy ($\chi^2 = 5.25$, df = 1) and the Holy Roman Empire ($\chi^2 = 7.91$, df = 1), the headdress was worn outside in greater proportions than for stiffened hats in general. Figure 52 shows the distribution of location of wear of stiffened hats by place of origin.

Stiffened hats were worn disproportionately by the yeoman/artisan/laborer class, but they were favored by the courtier/professional/official class ($\chi^2 = 25.38$, df = 4). Table 56 displays the relative proportions of the social classes wearing stiffened hats and wearing all headdress. The distribution of stiffened hats by social class and decade and social

Table 55. Distribution of the Position of the Headdress Among Stiffened Hats and All Headdress

	Centered (%)	Left (%)	Right (%)	Off Head (%)	N
Stiffened Hats	82.6	2.3	1.5	13.7	132
Overall	81.2	3.4	3.9	11.5	791

class and place of origin was such that contingency analysis was not possible.

Other Headdress Types

The remainder of the headdress types had very small sample sizes of eighteen or less. Statistical analysis over time and by place of origin was impractical, if not impossible. Two of the types, coifs and draped headdress, were represented throughout the study period, but were found only in small frequencies. The appearance of chaplets and rondelles occurred sporadically throughout the period. Four headdress types, sugarloaf hats, stocking hats, cauls, and flat hats, were restricted to particular short time spans. None of these headdress types, except coifs, were worn by clergy. The following were short summaries of notable characteristics of the remaining headdress types.

Chaplets and Rondelles

These two headdress types share the characteristic that they consist only of brims. Chaplets were defined as having only continuous brims and rondelles were defined as having only padded

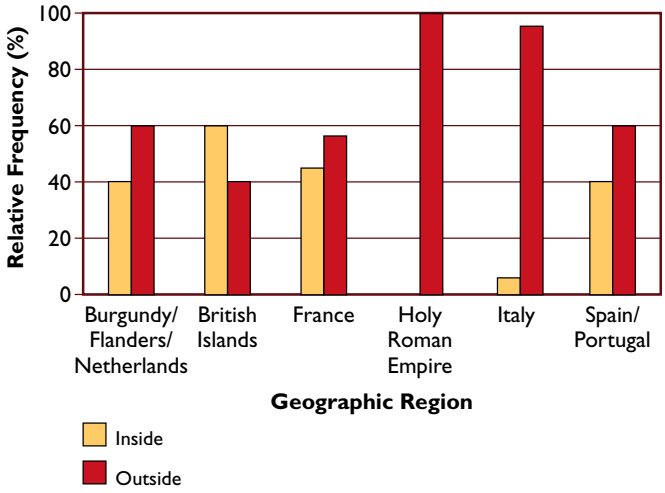

Figure 52
Relative Frequency of Interior/Exterior Usage of Stiffened Hats by Place of Origin

or twisted roll brims. Since they had no crown, they tended to cover less of the head than did the sample as a whole. Chaplets were often smaller than rondelles and generally covered 0% to 50% of the hair-growing area. Rondelles, being larger, covered 25% to 75% of the hair-growing area. Most rondelles and chaplets appeared prior to 1440, although chaplets seemed to have revived after 1500.

Coifs

There were never more than three coifs appearing in any decade and none ap-

Table 56. Distribution of Social Class Among Wearers of Stiffened Hats and Wearers of All Headdress

	Gentry (%)	CPO (%)	BM (%)	YAL (%)	Clergy (%)	N
Stiffened Hats	31.8	35.6	5.3	25.8	1.5	132
Overall	31.6	45.3	5.9	12.3	4.8	791

CPO = Courtier/professional/official BM = Burgher/merchant YAL = Yeoman/artisan/laborer

peared from 1410 to 1429. Coifs were found in all places of origin. By the nature of its design, coifs were plain caps that had no brims, always covered the ears, covered more than 75% of the hair-growing area, and was worn centered on the head. Coifs appeared in every social class, but seemed to be more concentrated in the courtier/professional/official classes. This accords well with Margaret Scott's view that by the fifteenth century, coifs were worn primarily by men in the professions.[2]

Draped Headdress

Draped headdresses were found throughout the study period, although mostly after 1470, in all places of origin except the British Islands. Coverage of the head was evenly distributed in every category except no draped headdress covered less than 25% of the hair-growing area. Most draped headdresses were white and unadorned. All social classes wore them except clergy.

Sugarloaf Hats

Sugarloaf hats were just very tall acorn hats, and they shared the features of acorn hats. Sugarloaf hats were found between 1460 to 1499, primarily between 1470 and 1479. The ten acorn hats were either brimless or had continuous brims. They were worn centered, covered about 25% to 50% of the hair-growing area and never covered the ears. The sugarloaf hats in this sample were generally either red or blue. Only members of the gentry and courtier/professional/official classes were portrayed wearing sugarloaf hats.

Stocking Hats

Stocking hats were also a variation on the acorn hat and were found from 1490 to 1519. The five stocking hats in the sample were either from Burgundy/Flanders/Netherlands or from the Holy Roman Empire. The stocking hat was worn centered, covered 50% to 100% of the head, and had either continuous or partial brims. All stocking hats in the sample were decorated; most with tassels. A stocking hat was present in all social classes except clergy.

Cauls

Cauls were also found only between 1490 and 1519, primarily in the Holy Roman Empire. They covered most of the hair-growing area, but generally not the ears. Most were brimless or had a small continuous brim. Many cauls were ornamented with figured fabrics. Cauls were worn mostly by men in the gentry or in the courtier/professional/official classes.

Flat Hats

Flat hats had fairly complex brims, including split, overlapping split and Robin Hood brims, and were found mostly in the Holy Roman Empire. All but one flat hat was decorated, usually with applied jewels. Half of the flat hats were worn tilted to one side or the other, and the other half were worn centered on the head. They generally covered 25% to 50% of the hair-growing area. As with cauls and sugarloaf hats, flat hats were worn mostly by men in the gentry or courtier/professional/official classes.

[2]Margaret Scott, *A Visual History of Costume: The Fourteenth & Fifteenth Centuries* (London: B. T. Batsford Ltd, 1986), 141