

HEAD CANTING IN PAINTINGS: AN HISTORICAL STUDY

Marco Costa, Marzia Menzani, and Pio Enrico Ricci Bitti

ABSTRACT: Head canting, a lateral shift of the head toward the shoulder axis, was examined in 1498 figures in the complete works of 11 painters from the XIV to the XX century: Martini, van Eyck Hubert and Jan, Holbein, Carracci, Velazquez, Rembrandt, Degas, Cézanne, Klimt, and Modigliani. All figures (up to 9 in any one painting) that were not in complete profile and that were not depicted bowing or shifting their bodies were selected for analysis. Our analysis found a higher frequency (49%) of head canting in paintings than previously reported in naturalistic settings. Head canting was significantly higher in female figures than male figures. If a figure's head was facing laterally, head canting was more likely to be to the contralateral side. Head canting was lower in older figures than in children, youths, and adults. The highest level of head canting was seen in religious and mythological figures. Head canting was lower in figures of artists and professionals and virtually absent in depictions of nobles. Figures in pose were depicted with less head canting than those in natural settings. Head canting was lower in figures gazing toward the observer. Single-figure portraits head canted less than subjects in multiple-figure paintings. Author analysis revealed that head canting was pronounced in painters of religious subjects and in modern painters, whereas its degree was reduced in official portrait painters. These results are discussed in terms of dominance theory.

KEY WORDS: head canting; portraits; dominance; gender differences; painting.

The aim of this study was to investigate how painters from the XIV to the XX century have used head canting for the emotional and aesthetic characterization of their subjects. Head canting refers to a lateral tilt of the

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head, a pose in which the line drawn from the center of the forehead down the nose to the chin is not perpendicular to the shoulders.

Head canting has been described as a submissive gesture (Key, 1975), an example of the "power differential" (Henley, 1977, 1973), an appeal for protection (Morris, 1977), and a form of ingratiation or appeasement achieved by reducing one's overall height (Goffman, 1976, 1979).

The relationship of gender to head canting is controversial. Kendon and Ferber (1973) in an observational study of young subjects at a party and Regan (1982), examining 1,296 portrait photographs of high school and college students, found a greater prevalence of head canting in females. However, Mills (1984), assessing how individuals would pose for social photographs without directions from a photographer, and Wilson and Lloyd (1990), analyzing self-posed postures of undergraduates in arts and science schools, did not find any gender effect. In Wilson and Lloyd (1990) art students displayed more smiling and head canting than science students, an effect that was interpreted as indicative of the greater power/self-esteem of the latter.

A 1987 report by Halberstadt and Saitta is the most comprehensive study to date on the relationship between head canting and perceived dominance. In a first study 1,106 portrayals in magazines and newspapers were assessed. Head canting was present in 42% of female figures and 43.5% of male figures and the difference was not significant. Race was significant with more canting among Blacks. In a second study of 1,257 unobtrusive naturalistic observations 37.7% of female subjects and 39.1% of male subjects exhibited head canting. Finally, in a third study, the effects of head canting on people's perceptions of male and female personality attributes were assessed. Female raters perceived subjects who head canted as more friendly and as more flirtatious. Furthermore, female models who did not head cant were perceived as more dominant.

In Otta, Lira, Delevati, Cesar, and Pires (1994) head canting resulted in high scores being reported for conciliation and beauty. Since head tilting is considered an appeasement gesture (Ragan, 1982) and these behaviors are used as part of courtship displays (Eibl-Eibesfeldt, 1972, 1989), the authors suggested that female subjects considered the male stimulus person with the head canted to be more handsome because their maternal impulses may be activated by a helpless (infantile) appearance.

In a developmental experimental investigation by Coss conducted with infants (1970), brow raising, which indicates interest and arousal, and eye contact, were strongest for stimuli depicting eyes presented in horizontal position as opposed to eye pattern placed vertically or obliquely. In addition, Eibl-Eibesfeldt (1988) has suggested that in friendly face-to-face

interactions, we tilt our heads sideways to dampen the arousal brought about by eye contact.

Until now, the use of head canting in portrait has not been investigated in a systematic way, although informal analyses have been done by art critics and historians. Rosa (1959), for instance, in his attempt to code emotional expressions concerning art works into fixed patterns, reported head canting as a constituent of the following situations: a) listening and communicating secrets; b) silent reproach, imploring; c) ingratiating oneself with someone; d) commiserative laughter; e) dejection; f) adoration; worship; g) supplication; h) uncertainty, doubt.

In the present study, the complete works of 11 well-known painters from the XIV to the XX century were examined. A first aim was to explore if head canting frequency in portraits mirrors data from real life situations as reported by Halberstadt and Saitta (1987). We hypothesized that the frequency and intensity of head canting in portraits would be higher than in real-life settings because painters have to convey emotional characterization using only visual cues. Thus, we expected that when painters were portraying a subject in a state of adoration, submission, femininity, or loveliness they would exaggerate this behavior. Second, head canting was correlated with the following characteristics of the portrayed person: a) gender; b) the number of persons that composed the painting; c) gaze direction (toward the observer or in other direction); d) context (naturalistic or in pose); e) age; f) status (mythological, religious, professional, noble, artist). Canting side, right or left, and head position, front, facing left, and facing right were also investigated. In regard to gender, the hypothesis was that head canting should be more frequent and pronounced for female than for male subjects. Since single-figure portraits are generally commissioned by the portrayed person and are intended to convey positive characterizations, it was expected that head canting should be lower when compared to paintings that included multiple figures. Gaze aversion is a typical sign of submission and, in contrast, gaze fixation is a sign of power and dominance. For these reasons, head canting in portraits where gaze was not directed toward the observer was expected to be higher. In regard to context, in naturalistic representations, canting was expected to be higher since posed portraits are meant to show the social status and positive traits of the subject, whereas in naturalistic settings, emotional expression plays a greater role. It must be emphasized that these last three factors are closely related. Single-figure portraits, in fact, are usually posed and gaze is directed toward the observer, whereas in multiple-figure paintings associated with naturalistic representations, the depicted persons are linked by mutual gazes.

Since, in previous centuries especially, dominance and social status increased with age, we hypothesized head canting would be used more frequently for younger subjects. As for status, given the close link between devotional expression and that of submission, a more frequent use of head canting in sacred paintings in comparison to portraits of nobles, professionals, artists, soldiers and other subjects of less submissive personalities was expected.

Given that Previc's (1994) data show a predominant leftward head tilt (point of view of the person who moves the head) in most right-handed individuals, a similar trend in paintings was hypothesized. Finally, regarding head position, a replication of Coles (1974) data, which did not show a profile orientation bias in a sample of 672 portraits from 1450 to 1800, was expected.

Method

The complete works of the following painters, reported in chronological order, were examined: Simone Martini (1284–1344) (Contini, 1970); Hubert van Eyck (died 1426), Jan van Eyck (died 1441) (Purtle, 1982; Brignetti & Faggini, 1968; Puyvelde, 1955); Hans Holbein the Young (1497/98–1543) (Salvini & Grohn, 1971); Annibale Carracci (1560–1609) (Cooney & Malafarina, 1976); Diego Rodriguez de Silva y Velazquez (1599–1660) (Bardi, 1969); van Rijn Rembrandt (1606–1669) (Arpino & Lecaldano, 1969); Edgar Degas (1834–1917) (Boggs, 1962); Paul Cézanne (1839–1906) (Gatto, 1979); Gustav Klimt (1862–1918) (Dobai & Coradeschi, 1978); Amedeo Modigliani (1884–1920) (Piccioni & Ceroni, 1970). These 11 painters were chosen because they are well known and representative of the artistic tendencies of their time and because they devoted their work mainly to the human figure depicting numerous single-figure paintings and small groups.

Figures were included in this study if they met these criteria: a) the face was depicted either frontally or in mid profile, but not in complete profile (both cheeks should be visible); b) in a multiple-figure painting, the total number of subjects did not exceed nine; c) the body should be erect or seated but not lying down or tilted; d) the face should be completely visible and not partially obscured by foreground figures.

A total of 1498 subjects fit these inclusion criteria and were distributed between the different painters as follows: Carracci: 133, Cézanne: 181, Degas: 105, Holbein: 113, Klimt: 69, van Eyck (Jan and Hubert): 101, Martini: 126, Modigliani: 279, Rembrandt: 280, Velazquez: 111.

The determination of figure's head tilt was based on deviation from vertical of the midsagittal plane joining the *nasion* (nose apex, middle

point between the eyebrows), middle point of the lips and tip of the mandible (*menton*), and expressed in degrees. Canting side left or right relative to observer was entered as a separate dichotic variable. Deviation of less than 1 deg led to the figure being classified as upright.

For each figure, seven other variables were considered: Gender, Head Position (frontal, middle left profile, middle right profile), Age (child, youth, adult, old), Social Status, Context, Gaze Direction (toward the observer or in the other direction), and number of total figures represented in the painting.

Social Status consisted of the following six categories: a) mythological subjects; b) religious subjects, which included representation of Christ, the Virgin, Saints, angels, but also monks, priests and biblical figures; c) artists, including self-portraits and representation of musicians, dancers, buffoons, sculptors, writers, poets; d) professionals such as merchants, bankers, archeologists, scholars, military officers, doctors; e) nobles which included all members of noble hierarchy from kings, queens, princes to barons and also cardinals and bishops when not saints for their position of noblesse within the Church; f) others, included all categories that occurred only a few times, mainly people belonging to the lower social classes such as beggars, servants, peasants. Status was coded only when indicated by the title and by the painting description provided by the curator. Consequently, it was included for 1099 figures out of 1498.

Context refers to the distinction between subjects in pose and subjects depicted in a naturalistic setting, involved in their work or in other activities. The last variable, total number of figures per painting could vary from 1 to a maximum of 9.

Data collection for head tilt was performed by two independent raters: the first and the second authors. Agreement between raters was computed with a Spearman correlation coefficient ($r = .97$) and mean values between the two raters entered the analysis. Coding for all nominal variables was performed by the first author. The second author coded 80 figures randomly selected from the total sample. Intercoder reliability was evaluated by using a ratio in which the number of evaluations on which the two coders agreed was multiplied by 2 and then divided by the total number of evaluations scored by both coders. The ratios of agreement were as follows: .98 for gender, .96 for head position, .79 for age, .85 for social status, .92 for context, 1.0 for gaze direction and number of figures. Statistical analyses concerning head canting were conducted using multiple ANOVAs, setting degrees of canting as dependent variables and all 8 category variables plus Painters as independent variables. Tukey (HSD) test was utilized for post-hoc comparisons.

Chi-square analyses were used to determine relations between cate-

gory variables. All head, face, and gaze directions are expressed relative to the observer (viewer) of the paintings.

Results

Over 1498 figures analyzed, head canting was present in 741 (49%) cases and was absent in 757 (51%). Canting was equally distributed for direction: 53% leftward and 47% rightward. Mean degrees of head canting were: 20.23° for left tilting, 17.52° for right tilting and 9.37° for all groups, including upright figures.

Gender

Male subjects comprised 55% of the figures, female subjects 45%. Head canting was significantly more pronounced in the female figures ($M = 12.08^\circ$) than in the male figures ($M = 7.2^\circ$) ($F[1, 1496] = 50.30$, $p < .001$). The interaction between Gender and Painter was significant ($F[9, 1478] = 6.58$, $p < .001$), and post-hoc tests revealed that the difference in head canting between male and female figures was significant for the following painters: Carracci ($p < .003$), Cézanne ($p < .003$), van Eyck ($p < .001$) and Martini ($p < .001$).

Head Position

Overall, 41% of all figures were depicted frontally, 31% facing left and 28% facing right. Head canting was not significantly affected by this variable. Analyses on the interaction between Head Position and Canting Side was significant ($\chi^2 = 121.92$, d.f. = 2, $p < .001$). When the figure was facing left and head canting was present, the direction of canting was much more likely to be in the opposite direction, rightward (75%) than leftward (25%), and the contrary when the head was facing right (80% leftward vs. 20% rightward). When the subject was depicted frontally there was an equal probability of left or right canting (55% leftward vs. 45% rightward).

Age

The overall effect of age on head canting was significant ($F[3, 1494] = 5.44$, $p < .001$), but post-hoc comparisons revealed that the effect was explained by the lower degree of head tilting in old subjects. Planned comparison between pooled Child, Youth and Adult ($M = 9.89^\circ$) and Old ($M = 4.36^\circ$) was significant ($F[1, 1494] = 14.94$; $p < .001$).

Status

The overall effect of a subject's social status was significant ($F[5, 1033] = 97.11, p < .001$). The extent of head canting was maximum for mythological and religious subjects ($M = 18.70^\circ$ and $M = 18.37^\circ$, respectively). The mean degree of head canting for the other social status categories were as follows: artists ($M = 3.93^\circ$), professionals ($M = 3.20^\circ$) and nobles ($M = 1.87^\circ$). Post-hoc tests evidenced that this effect was explained by the difference between the figures categorized as religious and mythological and the other social status categories including nobles, professionals, artists and others. Planned comparison analysis between these two groups was highly significant ($F[1, 1093] = 189.74, p < .001$).

Context

The effect of context effect was highly significant ($F[1, 1495] = 294.59, p < .001$). Figures depicted in posed settings exhibited a much lower canting ($M = 5.76^\circ$) than when depicted in naturalistic settings ($M = 17.62^\circ$).

Gaze Direction

The effect of gaze direction was significant ($F[1, 1480] = 37.30, p < .001$). When the figure was gazing toward the observer, as it was usually the case in formal portraits, mean head canting was lower ($M = 6.78^\circ$) than when the figure's gaze was averted from the observer ($M = 11.08^\circ$).

Number of Figures per Painting

The overall effect for this variable was significant ($F[8, 1489] = 32.86, p < .001$). Post-hoc comparisons revealed that the difference was significant between one figure vs. multiple figures independently of the total number. Mean head-canting in single-figure portraits was 6.58° , whereas for multiple-figure paintings the mean was 19.45° .

Painters

Differences in head canting among different painters were significant ($F[9, 1488] = 35.55, p < .001$). A marked use of head canting was observed for painters that devoted their work to religious subjects such as Martini (mean: 13°), van Eyck (mean: 17.36°), Carracci (mean: 20.90°). The mean angle of head canting was lower for those painters who mainly de-

picted portraits of important and distinguished persons such as Holbein (mean 3.89°), Velazquez (mean: 5.97°) and Rembrandt (mean: 3.16°). A renewed use of head canting emerged in modern painters as Cézanne (mean: 9.84°), Klimt (mean: 15.04°), and Modigliani (mean: 9.84°). In these painters, even if many of their works were portraits, the authors were free to choose their subjects and usually directed their attention to common people and friends. These artists, in fact, were less influenced by Maecenas (patrons) and more independent and free to portray their subjects in more naturalistic and individual poses.

Discussion

Halberstadt and Saitta (1987) reported a mean head canting frequency of 43% in media portrayals in magazines and newspapers, and of 38% in a large sample of unobtrusive observations. In the current study, examining 1498 figures in paintings from the XIV to the XX century, head canting occurred at a frequency of 49%. Painters have therefore made great use of this technique, more than it would be expected in real-life settings. As it was hypothesized in the introduction, since painters must characterize their figures using only visual cues, it is possible that they may exaggerate and emphasize head canting to give a clear and unambiguous profile of the status of their subjects.

Halberstadt and Saitta (1987) did not report degrees of head canting in their study. In a preliminary study in which we investigated head canting in self-posed student portraits, a mean head tilt of 4.63° was found. In the current study, we found frequent cases in religious and modern paintings in which head canting was much more pronounced and exaggerated compared to this mean. In Carracci, for instance, the mean angle of head canting was 20.9° and in some Madonna and Christ representations it reached 75°, in vanEyck we registered a Madonna with 58° canting, and, in Klimt, some heads were depicted nearly perpendicular to the body at angles that reached 82°, which is far beyond the physiological possibilities.

In the literature the influence of gender on head canting is not clear. Kendon and Ferber (1973), and Regan (1982), for example, reported a more pronounced head canting among female subjects but Mill (1984), and Wilson and Lloyd (1990) did not. In this study the gender effect was strongly present especially in those painters whose work was mainly of sacred and mythological subjects such as Carracci, van Eyck, and Martini. In contrast, we did not see a gender effect in those painters who devoted

their works to commissioned portraits such as Holbein, Modigliani, Rembrandt and Velazquez.

Early painters who operated mainly within the church, painting saints, the virgin Mary, Christ, angels and biblical or mythological scenes, showed more head canting in their figures than did painters who worked for commission painting portraits of nobles, kings, lords.

Other factors that were found to be associated with head canting were: status, age, context, gaze direction, and number of figures per painting. In regard to status, religious and mythological figures exhibited much more head canting than commissioned portraits. This finding supports the idea that head canting is strongly connected with the expression of submission, appeasement, ingratiation, and request for protection as stated by Key (1975), Henley (1977), Morris (1977), and Goffman (1976, 1979). In religious and mythological subjects, in fact, figures are mainly depicted with an expression of pity, or mercy, or expressing the adoration and worship of God. The great prevalence and degree of head canting in early religious paintings may be interpreted as a cue of the critical role played by submission and power differential in a society where social classes were strongly differentiated for status and power, and where the opportunities to change social status were severely limited. In contrast, in paintings portraying nobles, professionals, and artists, head canting was minimal or absent. The lack of head canting was particularly apparent in the subjects of those painters who worked on commission such as Holbein, Velazquez and Rembrandt. This is most likely because the purpose of the painting was to emphasize the power, social status, nobility, and beauty of the person that ordered the portrait, who was always a member of the higher social classes. For painters in the XIX century, such as Cézanne, Degas, Klimt and Modigliani, a new social condition for artists emerged that allowed these painters to choose their subjects. In addition they usually were independent of any form of patronage. Nobles and kings were no longer the preferred subjects for these new painters and members of lower classes such as peasants, craftsmen, and friends, became the new leading characters of their works. The predominant expression of power was replaced with a more naturalistic representation that emphasized subjects in their natural environments with a more spontaneous expression of status. In these painters the use of head canting became considerable and reached a mean of 9.5°.

The relationship of the subject's age to head canting was also significant. Degree of head canting was lower in older people than in youths and adults. This effect could be explained by the fact that, in the past, the average life span was shorter and authority and power were strictly the province of older persons.

Posed figures matched, for the most part, the formal portraits in which the painter had to emphasize the positive aspects of the figure and for this reason head canting was used much less than for figures depicted in naturalistic settings. This also explains the lower frequency of head canting in single-figure portraits compared to multiple-figure paintings.

Another connection between head canting and submission signals was the greater degree of canting in figures depicted with gaze not directed toward the observer. Gaze avoidance can be considered, in fact, as a submission signal (Larsen and Shackelford, 1996; Dixon, 1998). As for profile orientation, figures facing left or right were equally represented, confirming Coles (1974) data.

A problem for the inferences drawn in this study could stem from the choice of determined painters. In particular only European art was considered and only 11 painters were selected covering more than six centuries of history. For example, the inclusion of artists such as Lorenzo Lotto who was known for giving a slanting view to his portraits would have likely produced even stronger evidence of head canting. On the other hand, many of da Vinci's portraits are full-faced frontal views with little canting. Painters used in this study were selected by virtue of their fame and the influence they had on others. Furthermore only painters that focused on portraits or small groups were selected, and care was taken to use complete works of art for the chosen painters.

References

- Arpino, G. & Lecaldano, P. (1969). *L'opera pittorica completa di Rembrandt*. Milano: Rizzoli.
- Bardi, P.M. (1969). *L'opera pittorica completa di Velazquez*. Milano: Rizzoli Editore.
- Boggs, J.S. (1962). *Portraits by Degas*. Berkeley: University of California Press.
- Brignetti, R. & Faggin, G.T. (1968). *L'opera completa dei van Eyck*. Milano: Rizzoli.
- Coles, P.R. (1974). Profile orientation and social distance in portrait painting. *Perception*, 3, 303–308.
- Contini, G. (1970). *L'opera completa di Simone Martini*. Milano: Rizzoli.
- Cooney, P.J. & Malafarina, G. (1976). *L'opera completa di Annibale Carracci*. Milano: Rizzoli.
- Coss, R.G. (1970). The perceptual aspects of eye-spot pattern and their relevance to gaze behavior. In C. Hutt and S.J. Hutt (Eds.) *Behavior studies in psychiatry* (pp. 121–147). Oxford: Pergamon Press.
- Dixon, A.K. (1998). Ethological strategies for defense in animals and humans: Their role in some psychiatric disorders. *British Journal of Medical Psychology*, 71, 417–445.
- Dobai, J. & Coradeschi, S. (1978). *L'opera completa di Klimt*. Milano: Rizzoli.
- Eibl-Eibesfeldt, I. (1972). *Love and hate: The natural history of behavior patterns*. New York: Holt.
- Eibl-Eibesfeldt, I. (1988). The biological foundation of aesthetics. In I. Rentschler, B. Herzberger, D. Epstein (Eds.) *Beauty and the Brain: Biological Aspects of Aesthetics* (pp. 29–68). Basel: Birkhäuser Verlag.
- Eibl-Eibesfeldt, I. (1989). *Human ethology*. New York: Aldine de Gruyter.

- Gatto, A. (1979). *L'opera completa di Cézanne*. Milano: Rizzoli.
- Goffman, E. (1976). Gender advertisements. *Studies in the Anthropology of Visual Communication*, 3, 69–154.
- Goffman, E. (1979). *Gender advertisements*. New York: Harper & Row.
- Halberstadt, A.G. & Saitta, M.B. (1987). Gender, nonverbal behavior, and perceived dominance: A test of the theory. *Journal of Personality and Social Psychology*, 53, 257–272.
- Henley, N.M. (1973). Status and sex: Some touching observations. *Bulletin of the Psychonomic Society*, 2, 91–93.
- Henley, N.M. (1977). *Body politics: Power, sex, and nonverbal communications*. Englewood Cliffs, NJ: Prentice-Hall.
- Kendon, A. & Ferber, A. (1973). A description of some human greetings. In P. Michael & J.H. Crook (Eds.), *Comparative ecology and behavior in primates* (pp. 591–668). New York: Academic Press.
- Key, M.R. (1975). *Male/female language*. Metuchen, NJ: Scarecrow Press.
- Larsen, R.J. & Shackelford, T.K. (1996). Gaze avoidance: Personality and social judgments of people who avoid direct face-to-face contact. *Personality and Individual Differences*, 21, 907–916.
- McClelland, D.C. (1958). The use of measures of human motivation in the study of society. In J.W. Atkinson (Ed.), *Motives in fantasy, action, and society: A method of assessment and study* (pp. 518–552). Princeton, NJ: Van Nostrand.
- Mills, J. (1984). Self-posed behaviors of females and males in photographs. *Sex Roles*, 10, 633–637.
- Morris, D. (1977). *Manwatching: A field guide to human behavior*. New York: Abrams.
- Otta, E., Lira, B.B.P., Delevati, N.M., Cesar, O.P., & Pires, C.S.G. (1994). The effect of smiling and of head tilting on person perception. *Journal of Psychology*, 128, 323–331.
- Piccioni, L. & Ceroni, A. (1970). *I dipinti di Modigliani*. Milano: Rizzoli.
- Previc, F.H. (1994). The relationship between eye dominance and head tilt in humans. *Neuropsychologia*, 32, 1297–1303.
- Purtile, C.J. (1982). *The marian paintings of Jan van Eyck*. Princeton, NJ: Princeton University Press.
- Puyvelde, van L. (1955). *Hubert e Jan van Eyck*. Roma: Edizioni Mediterranee.
- Regan, J.M. (1982). Gender displays in portrait photographs. *Sex Roles*, 8, 33–43.
- Rosa, L.A. (1959). *L'espressione dei sentimenti nelle opere d'arte e nel vivo*. Bologna: Edizioni Minerva Tecnica.
- Salvini, R. & Grohn, H.W. (1971). *L'opera completa di Holbein il Giovane*. Milano: Rizzoli.
- Wilson, A. & Lloyd, B. (1990). Gender vs. power: Self posed behavior revisited. *Sex Roles*, 23, 91–98.