

## SHORT COMMUNICATION

# The largest Last Supper: depictions of food portions and plate size increased over the millennium

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Portion sizes of foods have been noticeably increasing in recent years, but when did this trend begin? If art imitates life and if food portions have been generally increasing with time, we might expect to see this have been increasing over a longer period of time, this might be reflected in paintings that depict food. Perhaps the most commonly painted meal has been that of Jesus Christ's Last Supper, chronicled in the New Testament of the Bible. A CAD–CAM analysis of the relative size of food in 52 representative paintings of the Last Supper showed that the relative sizes of the main dish (entree) ( $r=0.52$ ,  $P=0.002$ ), bread ( $r=0.30$ ,  $P=0.04$ ), and plates ( $r=0.46$ ,  $P=0.02$ ) have linearly increased over the past millennium.

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### Introduction

Public health concerns are increasingly being focused upon the downsides of food abundance, portion size and obesity. While this portion size focus is recent, the increasing portion size trend might have been much more gradual. If art imitates life and if food resources have become generally more available over the past millennium, we might expect the size of food the portions and plate sizes that are depicted in these paintings to increase over time.

Perhaps the most commonly painted meal has been that of Jesus Christ's Last Supper.<sup>1</sup> According to the Synoptic gospels (Matthew, Mark and Luke) in the New Testament of the Bible, the dinner takes place during a Passover evening (Matthew 26:20) in 'a large room upstairs, already furnished' (Mark 14:15; Luke 22:12). Although Paschal lamb would have normally been served for this particular Seder, the three accounts of the event make no mention of food other than bread and wine.<sup>2,3</sup> Indeed, what has not been analyzed is how the depiction of food has changed with time.

The prior millennium (1000–2000 AD) witnessed dramatic socio-historical increases in the production, availability, safety, abundance and affordability of food. Perhaps these changes could also be reflected in how food has been

depicted in this commonly understood, but uniquely interpreted, meal. This research investigates one link between food portion-size depictions throughout history. It compares the sizes of the food and plates that have been progressively depicted in the paintings of the Last Supper over the last millennium.

### Method

Based on selection criteria from the book, the Last Supper (2000), 52 of the most significant depictions of the Last Supper<sup>4</sup> over the last millennium (1000–2000 AD/CE) were analyzed for content and coded to determine changes over time.<sup>5</sup> The sizes of the loaves of bread, main dishes and plates were assessed.<sup>6</sup> To account for the varying dimensions of the paintings, the average sizes of these items were indexed based on the average size of the heads depicted in the paintings. This was aided by the use of a CAD–CAM program that allowed the items to be scanned, rotated and calculated regardless of their original orientation in the painting. An index of 2.0 for the bread would indicate that the average width of the bread was twice the width of the average disciple's head.

The calculation of relevant ratios of size was confirmed by two independent coders who were blinded to the purpose of the study. Analyses were conducted using SPSS for Mac (version 12.0, SPSS, Chicago, IL, USA), with  $P>0.05$  being considered as significant.

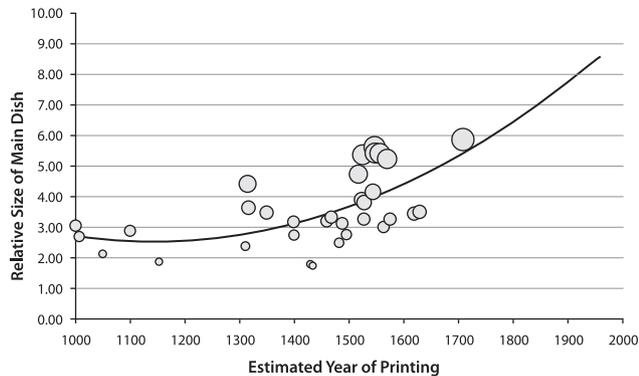
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**Table 1** Increase in size of food in depictions of the Last Supper with time

	Mean values from general time periods (standard deviations in parentheses)					Statistical results		
	1000–1300 (n = 10)	1300–1400 (n = 5)	1400–1500 (n = 15)	1500–1600 (n = 13)	1600–2000 (n = 9)	Correlation with year	R <sup>2</sup>	F-value
Relative size <sup>a</sup>								
Main dish size	2.53 (0.51)	3.50 (0.84)	2.71 (0.60)	4.44 (0.98)	4.28 (1.38)	0.52**	0.27	11.52**
Bread size	1.04 (0.29)	0.87 (0.20)	0.89 (0.20)	1.15 (0.54)	1.28 (0.25)	0.30*	0.09	4.40*
Plate size	1.17 (0.08)	1.33 (1.00)	1.31 (0.46)	1.34 (0.33)	1.94 (0.28)	0.46*	0.21	4.89*

<sup>a</sup>Relative size refers to the ratio of the average target item compared with the head size in each painting. \* $P < 0.05$ ; \*\* $P < 0.01$ .



**Figure 1** The relative size of the main dish in depictions of the Last Supper has increased over the millennium.

## Results

The discernable main dishes,<sup>5,7</sup> that were depicted in the paintings contained included fish or eel (18%), lamb (14%) and pork (7%); the remaining paintings had no discernable main dish (46%). Table 1 illustrates the positive relation between year and the 'main dish by head' ratio, 'bread by head' ratio, and 'plate by head' ratio.

Consistent with expectations, the size of food depicted in these paintings increased with time. The date of the painting explained 27% of the variation in size of the main course ( $P = 0.002$ ), 9% of the variation in size of the bread ( $P = 0.04$ ), and 21% of the variation in size of the average plate at the table ( $P = 0.04$ ). From its depiction circa 1000 AD/CE to the present, the ratio of this main course entrée has generally increased by 69.2%. Similarly, the ratio of the size of bread has increased by 23.1% and that of the size of plate by 65.6%.

Results of a nonlinear regression of years to entrée size show a nonlinear increase in the size of entrées over the years (see Figure 1). The year in which a painting was produced accounts for 27% of the variation in size of the entrée using a linear model. A nonlinear regression accounts for 41% of this variation because of the sharper increase in relative size from 1500 to 2000 AD.

## Discussion

The Last Supper is history's most famous dinner party.<sup>8</sup> Over the past millennium, the relative sizes of the

main dish ( $r = 0.523$ ,  $P = 40.002$ ), the bread ( $r = 0.304$ ,  $P = 0.040$ ), and the plate ( $r = 0.46$ ,  $P = 0.02$ ) have linearly increased when they are depicted in paintings.

Perhaps the increasing portion sizes and food availability, we have recently noticed is rooted in a general trend that has been artistically depicted for more than a millennium. Content analyzing the sizes or types of foods in art and media can provide a creative investigation of other engaging questions that are either longitudinal or cross-cultural. Other depictions of food in art and media may parallel their salience in day-to-day activities.<sup>9</sup> If so, the depiction of how food is longitudinally represented and discussed in TV, films and social media could allow an opportunity for a deeper meta-analysis of key trends in our current culture.

Whereas half of the paintings of the Last Supper included food and plates, most paintings did not depict wine, which precluded its analysis. Notwithstanding its absence, its spirit remains: the contemporary discovery of increasing portion sizes and food availability may be little more than 1000-year-old wine in a new bottle.

## Conflict of interest

The authors declare no conflict of interest.

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