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ABSTRACT

There have been two very different life cycles for important modern artists: some, including Picasso, have made their greatest contributions early in their careers, whereas others, like Cézanne, have produced their best work late in their lives. Art's young geniuses have worked deductively to make conceptual innovations, while its old masters have worked inductively, to innovate experimentally. These two life cycles emerge from quantitative analysis of a wide range of evidence, and recognizing the differences between them allows a new understanding of a number of issues in art history. The two life cycles are furthermore not limited to painting, for the association between deduction and early achievement, and that between induction and late creativity, also clearly appear in quantitative studies of the careers of important economists and poets. Understanding the careers of modern artists therefore leads to a deeper understanding of the life cycles of human creativity in general.

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Introduction

In May of 1902, already suffering acutely from the illness that would cause his death the following year, Paul Gauguin wrote from the Marquesas Islands to Georges-Daniel de Monfried, his most loyal friend, that "For two months I have been filled with one mortal fear: that I am not the Gauguin I used to be." Gauguin's fear was less for his life than for his art. Shortly before his death, he recorded in his notebook his faith that at any age "an artist is always an artist." Yet he was forced to continue by posing a question: "Isn't he better at some times, some moments, than at others? Never impeccable, since he is a living, human being?"[1]

Great artists whose lives are dominated by the desire to make the most important contributions they possibly can are inevitably drawn to thinking about the relationship between their stage of life and the quality of their work. Sometimes, as with Gauguin, the results are painful to read. In other cases they are amusing. So for example Gertrude Stein poked fun at the ambitious young Robert Delaunay. In *The Autobiography of Alice B. Toklas*, Stein wrote of Delaunay's frequent visits to her apartment, and his inspection of her remarkable art collection. She recalled that "He was always asking how old Picasso had been when he had painted a certain picture. When he was told he always said, oh I am not as old as that yet. I will do as much when I am that age."[2]

Whether poignant or comical, most artists have considered the relationship between age and the quality of work not in general, but within the specific context of their own careers, in looking back on the improvement over time in their skills, or in worrying about the deterioration of their abilities. Although their awareness of the relationship underscores its importance, their assessments of it obviously cannot be taken to have any degree of generality. Leaving artists'

judgments aside, we can pose very simply the question that I wish to consider: how, and why, does the quality of artists' work vary with age? The purpose of this paper is to present my theory of creative artists' life cycles, demonstrate how this theory can be implemented empirically, and examine some of the consequences of this analysis.[3]

Experimental and Conceptual Innovators

> Does creation reside in the idea or in the action?
> Alan Bowness, 1972[4]

My analysis begins with the proposition that there have been two very different types of artist in the modern era. These two types are distinguished not by their importance, for both are prominently represented among the greatest artists of the era. They are distinguished instead by the methods by which they arrive at their major contributions. In each case their method results from a specific conception of artistic goals, and each method is associated with specific practices in creating art. I call one of these methods aesthetically motivated experimentation, and the other conceptual execution.

Artists who have produced experimental innovations have been motivated by aesthetic criteria: they have aimed at presenting visual perceptions. Their goals are imprecise, so their procedure is tentative and incremental. The imprecision of their goals means that these artists rarely feel they have succeeded, and their careers are consequently often dominated by the pursuit of a single objective. These artists repeat themselves, usually painting the same subject many times, gradually changing its treatment in an experimental process of trial and error. Each work leads to the next, and none is generally privileged over others, so experimental painters rarely make specific preparatory sketches or plans for a painting. They consider the production of a painting as a process of searching, in which they aim to discover the image in the course of

making it; they often believe that learning is a more important goal than making finished paintings. Experimental artists build their skills gradually over the course of their careers, improving their work slowly over long periods. These artists are perfectionists, and are typically plagued by frustration at their inability to achieve their goals.

In contrast, artists who have made conceptual innovations have been motivated by the desire to communicate specific ideas or emotions. Their goals for a particular work can usually be stated precisely, before its production, either as a desired image or as a desired process for the work's execution. Conceptual artists consequently often make detailed preparatory sketches or plans for their paintings. Their execution of their paintings is often systematic, since they may think of it as primarily making a preconceived image, and often simply a process of transferring an image they have already created from one surface to another. Conceptual innovations typically appear suddenly, as a new idea immediately produces a result quite different not only from other artists' work but also from the artist's own previous work. Because it is the idea that is the contribution, conceptual innovations can usually be implemented immediately, and therefore are often embodied in individual breakthrough works.

The precision of their goals typically allows conceptual artists to be satisfied that they have produced one or more works that achieve a particular purpose. Unlike experimental artists, whose inability to achieve their vague goals can tie them to a single problem for a whole career, the conceptual artist's ability to consider a problem solved can free him to pursue new goals. The careers of some important conceptual artists have consequently been marked by a series of innovations, each very different from the others. Thus whereas over time an experimental artist typically produces many paintings that are closely related to each other, the career of the

conceptual innovator is often distinguished by discontinuity.

Archetypes

> I seek in painting.
>
> Paul Cézanne[5]
>
> I don't seek; I find.
>
> Pablo Picasso[6]

Two of the greatest modern artists epitomize the two types of innovator.

In September, 1906, just a month before his death, 67-year-old Paul Cézanne wrote to a younger friend, the painter Emile Bernard:

> Now it seems to me that I see better and that I think more correctly about the direction of my studies. Will I ever attain the end for which I have striven so much and so long? I hope so, but as long as it is not attained a vague state of uneasiness persists which will not disappear until I have reached port, that is until I have realized something which develops better than in the past ... So I continue to study.
>
> But I have just re-read your letter and I see that I always answer off the mark. Be good enough to forgive me; it is, as I told you, this constant preoccupation with the aim I want to reach, which is the cause of it.
>
> I am always studying after nature, and it seems to me that I make slow progress. I should have liked you near me, for solitude always weighs me down a bit. But I am old, ill, and I have sworn to myself to die painting.[7]

This brief passage expresses nearly all the characteristics of the experimental innovator: the visual criteria, the view of his enterprise as research, the need for accumulation of knowledge, the incremental nature and slow pace of his progress, the total absorption in the pursuit of an ambitious, vague, and elusive goal, the frustration with his perceived lack of success in achieving that goal of "realization," and the fear that he would not live long enough to attain it. The irony of Cézanne's frustrations and fears at the end of his life stems from the fact

that it was his most recent work, the paintings of his last few years, that would soon come to be considered his greatest contribution, and would directly influence every important artistic development of the next generation.

The critic Roger Fry eloquently discussed the incremental nature of Cézanne's approach:

> For him as I understand his work, the ultimate synthesis of a design was never revealed in a flash; rather he approached it with infinite precautions, stalking it, as it were, now from one point of view, now from another... For him the synthesis was an asymptote toward which he was for ever approaching without ever quite reaching it; it was a reality, incapable of complete realization.[8]

The historian Alan Bowness stressed Cézanne's inductive method and avoidance of preconception: "His procedure is always empirical, not dogmatic - Cézanne is not following a set of rules, but trying, with every new picture, to record his sensations before nature."[9] Emile Bernard spent a month in Aix in 1904, and recalled that Cézanne spent the whole month working on a single still life: "The colors and shapes in this painting changed almost every day, and each day when I arrived at his studio, it could have been taken from the easel and considered a finished work of art." Bernard reported that Cézanne "never placed one stroke of paint without thinking about it carefully," and concluded that his method of working was "a meditation with a brush in his hand."[10] Art scholars have often been puzzled by Cézanne's casual disregard for his own paintings, but his lack of concern appears understandable as a consequence of his experimental method. Thus the critic Clive Bell explained that Cézanne's real goal was not making paintings, but learning:

> The whole of his later life was a climbing towards an ideal. For him every picture was a means, a step, a stick, a hold, a stepping-stone - something he was ready to discard as soon as it had served his purpose. He had no use for his own pictures. To him they

> were experiments. He tossed them into bushes, or left them in the open fields...[11]

In 1923 Pablo Picasso gave a rare interview to a friend, the artist and critic Marius de Zayas, in which he presented the view that art should communicate discoveries rather than serving as a record of the artist's development:

> I can hardly understand the importance given to the word *research* in connection with modern painting. In my opinion to search means nothing in painting. To find, is the thing...
>
> When I paint my object is to show what I have found, not what I am looking for...
>
> The several manners I have used in my art must not be considered as an evolution or as steps toward an unknown ideal of painting...
>
> I have never made trials or experiments. Whenever I had something to say, I have said it in the manner in which I have felt it ought to be said. Different motives inevitably require different methods of expression.[12]

Picasso's rejection of the description of his art as an evolution was not merely posturing, but has been confirmed by generations of observers. As early as 1920, with Picasso not yet 40 years old, Clive Bell described his career as "a series of discoveries, each of which he has rapidly developed," and commented on the abruptness and frequency of his stylistic changes, a theme that would later be echoed by dozens of biographers.[13] Thus decades later the critic John Berger wrote of Picasso's "sudden inexplicable transformations," and observed that "in the life work of no other artist is each group of works so independent of those which have just gone before, or so irrelevant to those which are to follow."[14] Historian Pierre Cabanne made this point by comparing Picasso with Cézanne: "There was not one Picasso, but ten, twenty, always different, unpredictably changing, and in this he was the opposite of a Cézanne, whose work ... followed that logical, reasonable course to fruition."[15]

Picasso often planned his paintings carefully in advance. During the winter of 1906-07, he filled one sketchbook after another with preparatory studies for *Les Demoiselles d'Avignon*, the large painting that was to become his most famous single work.[16] Historian William Rubin estimated that Picasso made more than 400 studies for the *Demoiselles,* "a quantity of preparatory work ... without parallel, for a single picture, in the entire history of art."[17] The painting was a brutal departure from the lyrical works of the Rose period that immediately preceded it, and its arrival rocked Paris' advanced art world. Henri Matisse denounced the painting as an attempt to ridicule the modern movement, and even Georges Braque, who would later realize that he and Picasso "were both headed in the same general direction," initially reacted to the painting by comparing Picasso to a fairground fire-eater who drank kerosene to spit flames.[18] The importance of the *Demoiselles* stems from its announcement of the beginning of the Cubist revolution, which Picasso and Braque would develop in the next few years. As historian John Golding has observed, Cubism was a radical conceptual innovation, based not on vision but thought:

> Even in the initial stages of the movement, when the painters still relied to a large extent on visual models, their paintings are not so much records of the sensory appearance of their subjects, as expressions in pictorial terms of their idea or knowledge of them. "I paint objects as I think them, not as I see them," Picasso said.[19]

<u>Planning, Working, and Stopping</u>

> For any given artist, what does his work signify? A passion? A pleasure? A means, or an end? For some, it dominates life; for others, it is a part of it. According to their natures, some will pass easily from one work to another, tear up or sell, and go on to something quite different; others, on the contrary, become obsessed, involved in endless revision, cannot give up the game, turn their backs on their gains and losses: like gamblers, they keep

doubling the stakes of patience and determination.
Paul Valéry, 1936[20]

The distinction between experimental and conceptual artists can be sharpened by considering their procedures in making paintings. For this purpose, we can divide the process into three stages: planning - all the artist does before beginning a particular painting; working - all the artist does while in the process of putting paint on the canvas; and stopping - the decision to cease working.[21]

For experimental artists, planning a painting is unimportant. The subject selected might be simply a convenient object of study, and frequently the artist returns to work on a motif he has used in the past. Experimental painters rarely make elaborate preparatory sketches. Their most important decisions are made during the working stage. The artist typically alternates between applying paint and examining the emerging image; at each point, how he develops the image depends on his reaction to what he sees. Lacking a clear goal for the work, the artist is looking for things he finds interesting or attractive. If he finds them, he may continue working; if he doesn't, he may scrape off the image, or paint over it. The decision to stop is also based on inspection and judgment of the work: the painter stops when he cannot see how to continue the work. Sometimes this is because he likes the painting and considers it finished, but often he remains dissatisfied, but can't see how to improve the work. In either case, experimental painters are prone to considering the decision to stop as provisional, and often return to work on paintings they earlier abandoned or considered finished, even after long intervals.

For the conceptual artist, planning is the most important stage. Before he begins working, the conceptual artist wants to have a clear vision either of the completed work or of the

process that will produce it. Conceptual artists consequently often make detailed preparatory sketches or other plans for a painting. With the difficult decisions already made in the planning stage, working and stopping are straightforward. The artist executes the plan, and stops when he has completed it.

The history of modern art contains a series of important artists who considered the essence of art to be in the planning stage, rendering the execution of the work perfunctory. Prominent examples come readily to mind. When visitors to his studio praised his great painting of the island of the Grande Jatte, Georges Seurat remarked to a friend, "They see poetry in what I have done. No, I apply my method and that is all there is to it."[22] In 1885 Paul Gauguin advised Emil Schuffenecker, "Above all, don't sweat over a painting; a great sentiment can be rendered immediately."[23] In 1888 Vincent van Gogh wrote to his brother that "I am in the midst of a complicated calculation which results in a quick succession of canvases quickly executed but calculated long *beforehand*."[24] Marcel Duchamp explained that his artistic goal was "to get away from the physical aspect of painting."[25] Charles Sheeler recalled that in 1929 he began "a period that followed for a good many years of planning a picture very completely before starting to work on the final canvas, having a blueprint of it and knowing just exactly what it was going to be."[26] Ad Reinhardt wrote in 1953 that a technical rule for painting should be that "Everything, where to begin and where to end, should be worked out in the mind beforehand."[27] Andy Warhol declared in 1963 that "the reason I'm painting this way is that I want to be a machine."[28] A few years later Sol LeWitt stated that in his art "all of the planning and decisions are made beforehand and the execution is a perfunctory affair."[29] Chuck Close explained that creating his images of faces from photographs is done methodically: "I have a system for how the head is

going to fit into the rectangle. The head is going to be so big, it is going to come so close to the top edge, and it is going to be centered left to right."[30] Robert Smithson told an interviewer in 1969 that "An object to me is the product of a thought."[31] Robert Mangold wrote in 1988 that "I want to approach the final painting with a clear idea of what must happen."[32] Gerhard Richter wrote that when he painted "I simply copied the photographs in paint and aimed for the greatest possible likeness to photography;" a consequence of this procedure was that "conscious thinking is eliminated."[33] Audrey Flack recalled the moment when she arrived at her practice of painting over projections of color slides: "It was late at night and I suddenly had the idea of projecting an image onto the canvas ... I owned no projector but was so excited by the idea that I called a friend who immediately responded to the urgency of my request... This was the beginning. It opened up a new way of seeing and working."[34] Ed Ruscha was equally pleased to find his method: "It was an enormous freedom to be premeditated about my art... I was more interested in the end result than I was in the means to an end."[35] Bridget Riley recently explained that "My goal was to make the image perfect, not mechanical ... but perfect in the sense of being exactly as I intended it."[36]

Just as readily, we can find important modern artists who believed that the source of their achievement lay in the process of painting. Frustrated by the changing weather that slowed his progress on his paintings of Rouen Cathedral in 1893, Claude Monet wrote to his wife that "the essential thing is to avoid the urge to do it all too quickly, try, try again, and get it right."[37] Auguste Renoir explained that his paintings took time to develop: "At the start I see my subject in a sort of haze. I know perfectly well that what I shall see in it later is there all the time, but it only becomes apparent after a while."[38] Wasily Kandinsky wrote that "Every form I ever used

constituted itself 'of its own accord,'" with a form frequently "constituting itself actually in the course of work, often to my own surprise."[39] In 1909 Paul Klee wrote in his diary that "in order to be successful, it is necessary never to work toward a conception of the picture completely thought out in advance. Instead, one must give oneself completely to the developing portion of the area to be painted."[40] When a young artist visited the New York studio of the aging Piet Mondrian and asked him whether he wasn't losing good pictures by continually revising the same canvases, Mondrian replied "I don't want pictures, I just want to find things out."[41] Joan Miró told an interviewer in 1948 that "Forms take reality for me as I work. In other words, rather than setting out to paint something, I begin painting and as I paint the picture begins to assert itself, or suggest itself under my brush."[42] Alberto Giacometti told a critic "I don't know if I work in order to do something or in order to know why I can't do what I want to do."[43] Mark Rothko declared that "I think of my paintings as dramas ... Neither the action nor the actors can be anticipated."[44] Jackson Pollock explained in 1947 that "I have no fears about making changes, destroying the image, etc., because the painting has a life of its own. I try to let it come through."[45] Hans Hofmann told an interviewer that "At the time of making a picture, I want not to know what I'm doing; a picture should be made with feelings, not with knowing."[46] William Baziotes wrote that "What happens on the canvas is unpredictable and surprising to me."[47] Robert Motherwell recorded his realization "that each brush stroke is a decision."[48] Howard Hodgkin told a critic that "My pictures really finish themselves."[49] Balthus wrote that "A painting's different stages betray the painter's endless trial and error as he tries to arrive at what he feels is the definitive, final, completed state."[50] Pierre Alechinsky explained that "I apply myself to seeking out images that I do not know ... Indeed, it would be sad to know in advance

that which is to come, for the simple reason that it deprives one of the sense of discovery."[51] Francis Bacon told an interviewer that "in my own work the best things just happen - images that I hadn't anticipated."[52] Pierre Soulages described the process of making a painting as "a kind of dialogue between what I think is being born on the canvas, and what I feel, and step by step, I advance and it transforms itself and develops."[53] Richard Diebenkorn confessed that "I find that I can *never* conceive a painting idea, put it on canvas, and accept it, not that I haven't often tried."[54] Helen Frankenthaler recalled how she learned to compose her paintings: "When one made a move toward the canvas surface, there was a dialectic and the surface gave an answer back, and you gave it an answer back."[55] Joan Mitchell facetiously placed her style within the context of 1960s art: "Pop art, op art, flop art, and slop art. I fall into the last two categories."[56] Susan Rothenberg said of her paintings that "The results are a way of discovering what I know and what I don't."[57]

The contrast between the two types of artist is just as sharp if we consider differences in practice just in the final stage of making a painting. Considering the two archetypal cases discussed above, Cézanne almost never considered his paintings finished. His friend and dealer Ambroise Vollard observed that "When Cézanne laid a canvas aside, it was almost always with the intention of taking it up again, in the hope of bringing it to perfection."[58] One consequence of this was that Cézanne rarely signed his works: less than 10% of the paintings in John Rewald's recent catalogue raisonné are signed.[59] In contrast, Picasso always signed his works, and often dated them not only with the customary year but also the month and day - and occasionally even the time of day - of their execution.[60] He told his companion Francoise Gilot that "I paint the way some people write their autobiography. The paintings, finished or not, are

the pages of my journal, and as such they are valid. The future will choose the pages it prefers. It's not up to me to make the choice." Although Picasso explained that he did not always take the time to complete his works, he did not share Cézanne's doubt over whether it was possible to complete them, as he told Gilot that "In some of my paintings I can say with certainty that the effort has been brought to its full weight and conclusion."[61]

Innovation and Age: Old Masters and Young Geniuses

> When a situation requires a new way of looking at things, the acquisition of new techniques, or even new vocabularies, the old seem stereotyped and rigid... But when a situation requires a store of past knowledge then the old find their advantage over the young.
>
> Harvey Lehman, 1953[62]

> Picasso was a rare prodigy. Cézanne was not a prodigy, his art was a hard-earned skill that took a lot of time.
>
> David Hockney, 1997[63]

Recognizing the differences between the experimental and conceptual approaches provides the basis for systematic predictions concerning the relationship between age and artistic innovation. The long periods of trial and error often required for important experimental innovations should mean that they will tend to occur late in an artist's career. Because conceptual innovations are made more quickly, it might be thought that they should be equally likely to occur at any age. Yet the achievement of radical conceptual innovations depends on the ability to perceive and appreciate the value of extreme deviations from existing conventions and traditional methods, and this ability will tend to decline with experience, as habits of thought become more firmly established. The most important conceptual innovations should therefore tend to occur early in an artist's career. As noted above, some conceptual artists will make a

series of unrelated contributions over the course of their careers, but this analysis predicts that the most important of these will generally be the earliest.

The predictions presented here have a parallel in the research of psychologists on when successful practitioners of a variety of academic disciplines and fine arts have produced their major contributions. Psychologists have found that chemists, mathematicians, physicists, and poets typically do their best work at younger ages than do astronomers, geologists, medical scientists, novelists, and philosophers.[64] A suggested explanation for these differences proposes that they are a function of the rates at which creative ideations can be produced and elaborated: new ideas might be conceived and developed more rapidly in disciplines that are more abstract.[65]

The inductive methods of experimental innovators in painting makes their enterprise resemble the more empirical disciplines considered by the psychologists, while the deductive approach of the conceptual innovators makes theirs resemble the more abstract disciplines. Cézanne did not even formulate the central problem of his career, of making Impressionism a more timeless and solid art, until he was in his mid-thirties. He then worked steadily at developing his solution to that problem - "searching for a technique" - for more than three decades, and arrived at his most important contribution at the end of his life.[66] In contrast, Picasso conceived his most important idea while in his mid-twenties, when he painted the *Demoiselles*, and he and Braque developed that idea into the several forms of Cubism, his most important contribution, within less than a decade. By 1914 Picasso had thus concluded "the most complete and radical artistic revolution since the Renaissance."[67] He was then just 33, the same age at which Cézanne had traveled to Pontoise to learn from Pissarro the techniques of Impressionism, which became the starting point for the quest that would culminate in his greatest

achievement more than 30 years later. Cézanne's slow production and elaboration of his creative ideas led to a very late peak in the quality of his work, whereas Picasso's rapid production and development of his new ideas led to a very early peak.

Artists, Scholars, and Art Scholars

> Today it is again apparent that the artist is an artisan, that he belongs to a distinct human grouping as *homo faber*, whose calling is to evoke a perpetual renewal of form in matter, and that scientists and artists are more like one another as artisans than they are like anyone else.
>
> George Kubler, 1962[68]

> Why do people think artists are special? It's just another job.
>
> Andy Warhol, 1975[69]

> The more I've read of mathematicians and physicists, the more engrossed I've become. They really seem like artists to me.
>
> David Hockney, 1988[70]

The next important step in this presentation is to consider how the theoretical predictions I've just made can be tested empirically. Before doing this, however, it is useful briefly to indicate how my analysis relates to some earlier treatments in art history.

Perhaps the most generally acclaimed recent examination of the context within which artists make paintings is Michael Baxandall's *Patterns of Intention*. In order to understand how objects come to be made, Baxandall begins the book with a description of the construction of a bridge in Scotland in the 19th century. A company formed by four railroads decided where they wished to have a bridge, then hired an engineer to design and build it. Baxandall then uses this framework to consider the production of paintings, with the artist in the role of the engineer.

Curiously, Baxandall's first application of this framework is not, as might be expected, to a case in which a Renaissance prince or cardinal hired a painter to execute a commission, but

rather to Picasso in 1910.[71] Since Picasso was not hired by Daniel-Henry Kahnweiler to paint his portrait, much less given a set of criteria for the work, Baxandall must begin by making a series of adjustments to his framework in order to apply it to this situation. My object here is not to argue with Baxandall's conclusions, nor is it to understand his motivation in proceeding in such a roundabout way. My point is simply that in approaching the issue of modern artists' motivations it would appear more pragmatic to begin with a model that is closer to the situation of the modern artist. And we do not have far to look for such a model, for there are strong parallels between the situation of the modern artist and that of the research scholar.

Like the research scholar, the modern artist's goal is to innovate - to produce new methods and results that change the work of other practitioners. Most often, this involves not only solving problems, but also formulating them. Most great modern art, like most great scholarship, is unlike the case of the bridge, in which someone hires an agent to solve a recognized problem. In most cases important scholarly and artistic innovations come from perceiving a previously unrecognized problem, or formulating a previously recognized problem in a novel way, before creating a solution to it. And since in both scholarship and art questions are usually more durable than answers, the principal contribution often lies more in the recognition and formulation of the problem than in the specific solution offered.

This parallel between artists and scholars is not novel, for it has been drawn by several art scholars. In a lecture first given in 1948 the historian Meyer Schapiro compared modern artists to scientists in their commitment to "endless invention and growth" in their respective disciplines.[72] And in his 1962 book, *The Shape of Time*, the historian George Kubler regretted our "inherited habit of separating art from science," for he observed that "the value of any

rapprochement between the history of art and the history of science is to display the common traits of invention, change, and obsolescence that the material works of artists and scientists both share in time."[73] Yet these analyses of Schapiro and Kubler have been largely ignored by art historians, perhaps because they conflict with the romanticized view of the artist's enterprise that serves as the implicit foundation for much of art history.[74]

It is unfortunate that the parallel between artists and scholars has not been more widely recognized, for it might have served as a corrective to some of the less compelling analyses of artists' motivations, by social scientists as well as humanists. We understand, for example, that in the first instance virtually all important scholarship is produced for an audience of other scholars. Scholars may do this out of love for their discipline, but even if their goals are more self-serving, they recognize that influence within their discipline will often help them achieve fame and fortune. Great artists appear to be no different. They may work from a variety of motives, but their first goal is generally to influence their fellow artists. They understand that if they are successful in this, public acclaim and lucrative sales will generally follow.[75]

The careers of successful scholars and artists also have a common structure. At the graduate level, most important scholars have worked with a teacher who is himself an important contributor to the discipline. The same is true for artists. Few important modern painters have been self-taught, for at a formative stage of their careers most have studied, formally or informally, with successful older artists, who not only provided them with technical instruction and advice, but inspired and encouraged them. Similarly, just as at an early stage of their careers most successful scholars have studied and worked closely with other promising scholars of their own generation, virtually all successful modern artists have initially developed their art in the

company of other talented young artists. In some cases these relationships involved collaborating to solve a problem of common interest, but even when the artists' goals differed considerably, these alliances provided moral support as well as challenges to the young artists involved. Thus for example Robert Rauschenberg recalled that at a time when he and Jasper Johns were developing their art with little understanding or encouragement from the art world at large, the support they gave each other gave them "permission to do what we wanted."[76] The complexity of these early collaborations is suggested by Gerhard Richter's comments on his relationship with two fellow art students, Sigmar Polke and Konrad Lueg, in the early 1960s. At the time, in 1964, he wrote:

> Contact with like-minded painters - a group means a great deal to me: nothing comes in isolation. We have worked out our ideas largely by talking them through. Shutting myself away in the country, for instance, would do nothing for me. One depends on one's surroundings. And so the exchange with other artists - and especially the collaboration with Lueg and Polke - matters a lot to me: it is part of the input that I need.

Nearly 30 years later, when an interviewer asked him about his earlier collaboration with Polke and Lueg, Richter stressed a different aspect of it:

> There were rare and exceptional moments when we were doing a thing together and forming a kind of impromptu community; the rest of the time we were competing with each other.[77]

All of these early collaborations probably contain elements of both cooperation and competition, and both are probably critical to the early development of ambitious artists. The importance of these collaborations is sometimes overlooked, for they usually dissolve as artists age and their interests diverge, but it is important to notice how often the contributions even of apparently isolated artists are in fact the product of working out solutions to problems that were formulated

earlier in groups.

The distinction I have drawn between the two types of artistic innovator is equally not a new one, for the difference in artists' approaches has been noted by several art scholars. In his survey of the history of modern art Alan Bowness observed that the difference between what he called realist and symbolist artists "may depend on certain basic temperamental differences among artists - on, for example, the degree to which the painter or sculptor can envisage the finished work of art before he starts to make it."[78] The critic David Sylvester made a similar observation in comparing two generations of American painters, as he noted that "Some artists like to think that they are working in the dark, others that they are firmly in control;" whereas the Abstract Expressionists "subscribed to the idea that making art meant feeling one's way through unknown territory," the work of the leading artists of the '60s was "carefully planned, tightly organized, precise in execution."[79]

Although both Bowness and Sylvester clearly recognized the distinction I have described here, neither pursued it, and most importantly neither appears to have perceived its most startling implication - the difference in the creative life cycles of the two groups of innovators. I have found only one art scholar who does appear to have identified essentially this difference in life cycles. Roger Fry devoted his inaugural lecture as professor of fine art at Cambridge University in 1933 to outlining a more systematic approach to the study of art. In the course of this attempt, Fry observed that an artist's experiences must inform his work, and that "the mere length of time that an artist has lived has then inevitably an influence on the work of art." Fry then continued:

> When we look at the late works of Titian or Rembrandt we cannot help feeling the pressure of a massive and rich experience which leaks out, as it were, through the ostensible image presented to us,

> whatever it may be. There are artists, and perhaps Titian and Rembrandt are good examples, who seem to require a very long period of activity before this unconscious element finds its way completely through into the work of art. In other cases, particularly in artists whose gift lies in a lyrical direction, the exaltation and passion of youth transmits itself directly into everything they touch, and then sometimes, when this flame dies down, their work becomes relatively cold and uninspired.

After making this statement, Fry immediately acknowledged the casual nature of his comments, conceding apologetically that "I fear a great deal of this must appear to you to be rather wildly speculative and hazardous." Although it is not known whether Fry intended to pursue this particular observation, his death the following year prevented any effort on his part to document the hypothesis, and although many decades have passed since Fry spoke, no art historian has taken up the challenge to do this. Yet today, seventy years later, I believe that my research provides a firm evidentiary basis for Fry's remarkable generalization, using the kind of "systematic study in which scientific methods will be followed wherever possible" that he called for in that lecture in 1933.[80]

Quantifying Artistic Success

> The modern professional humanist is an academic person who pretends to despise measurement because of its "scientific" nature. He regards his mandate as the explanation of human expressions in the language of normal discourse. Yet to explain something and to measure it are similar operations. Both are translations.
>
> George Kubler, 1962[81]

There is no single direct and obvious way to measure the quality of an artist's work over the course of his career. Instead, there is a variety of indirect ways. Each is based on a different kind of evidence, and each of these types of evidence was produced by a different group of judges. None of these groups of people were engaged in the activity that is my concern, of

measuring individual artists' creative life cycles. Yet as will be seen, each of the groups' actual goals has the effect of generating evidence that can be used for just this purpose. The independence of the processes that generated the bodies of evidence means that comparison of the various results can serve to test the robustness of any conclusions. If the results obtained from the different measures agree, the degree of confidence in the collective results will obviously be greater than that associated with the results obtained from any single measure.

Prices

> Each stylistic portion of an artist's total time span constitutes a separate sum of artifacts, and this is recognized by the art market in the values it places upon certain "periods" of an artist's work in contrast to others.
>
> Harold Rosenberg, 1974[82]

Each year, the outcomes of auctions of fine art held throughout the world are collected by a publisher in Lausanne, Switzerland, and issued in bulky volumes titled *Le Guide Mayer*. These volumes provide the evidence for my econometric analysis of the prices of paintings. My analysis is based on the proposition that variation in the sale prices of a particular painter's work, in all auctions held during the years 1970-97, can be systematically accounted for in part by the values of a set of associated variables for which evidence is given in *Le Guide Mayer*: specifically, these are the artist's age when a given work was executed, the work's support, its size, and the date of its sale at auction.

The estimates obtained for the multiple regression equation for a given artist allow us to isolate the effect of an artist's age at the time a painting was produced on the sale price of the painting, separating this effect from the impact on that price of the work's support, size, and sale date. The estimates can therefore be used to trace out the relationship between age and price for

an artist as illustrated in Figures 1 and 2, which show the estimated age-price profiles for Cézanne and Picasso, respectively. Each of these figures represents the hypothetical auction values of a series of paintings of identical size, support, and sale date, done throughout the artist's career.

The auction market clearly values Cézanne's late work most highly. Figure 1 shows that the estimated peak of his age-price profile is at age 67; a painting done in that year is worth approximately 15 times that of a work the same size he painted at age 26. In contrast, Picasso's age-price profile reaches a peak at age 26 - in 1907, the year he painted *Les Demoiselles d'Avignon*. A painting he did in that year would be worth more than four times as much as one the same size he produced when he was 67.

Before proceeding to consider other measures and other artists, it is useful to consider the impact of a potential bias involved in using auction data to estimate the relative value of an artist's work over the life cycle. The issue in question involves famous artists, like Cézanne and Picasso, whose work is eagerly sought by museums. Although museums sometimes sell paintings, in general they are believed to be less likely to sell than are private collectors. How does the absence from the auction market of museum holdings of great artists' work bias estimates like those of Figures 1 and 2?

This question has never been systematically examined, but evidence for Cézanne can be drawn from John Rewald's catalogue raisonné of his work, which includes information on the ownership of each painting at the time the book was published in 1996.[83] Considering the oil paintings, the probability that a painting was owned by a museum was considerably greater for late than for early paintings.[84] This in itself does not bias the age-price profile of Figure 1, but

would merely tend to reduce the amount of auction evidence on the value of late paintings from which to estimate that relationship. Yet what can bias the profile of Figure 1 is that museums don't tend to take paintings randomly from a given period of an artist's career, but rather pursue most avidly the best works. We do not have direct measures of quality for Cézanne's paintings, but the catalogue raisonné does contain evidence on their sizes. This serves as a proxy for quality, for larger paintings are typically considered more important than smaller ones.[85] Analysis of the evidence of the catalogue raisonné strongly confirms that the works by Cézanne owned by museums are on average considerably larger than those in private collections.[86]

The catalogue raisonné therefore shows that it is not just late works by Cézanne that are disproportionately removed from the auction market, but that it is the best of the late works that are most disproportionately absent. If none of Cézanne's works were owned by museums, the average quality of his late paintings coming to auction would likely rise relative to the average quality of the early works sold, and the profile of Figure 1 would consequently rise even more steeply with the artist's age than it does. Thus for Cézanne the impact of museum purchases is actually to reduce the estimated value of the works the auction market considers his best - the late works - relative to the rest of his paintings. This reinforces the conclusion from Figure 1 that his latest works are the most valuable.[87]

Textbook Illustrations

> Quality in art can be neither ascertained nor proved by logic or discourse. Experience alone rules in this area... Yet, quality in art is not just a matter of private experience. There is a *consensus* of taste. The best taste is that of the people who, in each generation, spend the most time and trouble on art, and this best taste has always turned out to be unanimous, within certain limits.
>
> Clement Greenberg, 1961[88]

Few art historians or critics have been important art collectors, so although the judgments of art historians may play an indirect role in determining the prices of paintings, through their influence on collectors, the art market does not directly measure the opinions of art scholars. This is not true, however, of textbooks, in which art scholars systematically set down their views.

Published surveys of art history nearly always contain photographs that reproduce the work of leading artists. These reproductions are chosen to illustrate each artist's most important contribution or contributions. No single book can be considered definitive, because no single scholar's judgments can be assumed to be superior to those of his peers, but pooling the evidence of the many available books can effectively provide a survey of art scholars' opinions on what constitutes a given artist's best period. The scores of authors and editors of textbooks of art history published in recent decades include many distinguished academics, among them George Heard Hamilton of Yale and Martin Kemp of Oxford, and such prominent critics as Robert Hughes of *Time* and John Canaday of the *New York Times*. But although the eminence of the authors varies, all the authors are likely to be among those who, in Clement Greenberg's words, "spend the most time and trouble on art," for they have made the considerable effort to communicate their views on the history of art in a systematic way. And for the modern period, the number of textbooks available is sufficiently large that no important result will be significantly influenced by the opinions of any single author or any one book.

Tabulating illustrations in textbooks is obviously analogous to a citation study, in which the relative importance of scholarly publications is judged by the number of citations they receive. Yet using illustrations as the unit of analysis has considerable advantages over citation

counts, for illustrations are substantially more costly than written references. In addition to the greater space taken up by the illustration and the greater cost of printing, authors must obtain and pay for copyright permission to reproduce each painting, and must buy or rent a suitable photograph. This substantial cost in time and money implies that authors will be more selective in their use of illustrations, and that these may consequently give a more accurate indication than written references of what an author considers genuinely important.

Table 1 demonstrates the use of this evidence for Cézanne and Picasso. It presents the distribution of all the illustrations of their work, tabulated by the artist's age at the date of the work's execution, contained in 33 textbooks published in English since 1968. The contrast in the two distributions is striking. Whereas Cézanne's illustrations rise steadily with age, with more than a third of his total representing works done in just the last eight years of his life, nearly two-fifths of Picasso's illustrations are of works he painted in his twenties, with a sharp drop thereafter. And for both artists the single year represented by the largest number of illustrations is precisely the same as the year estimated to be that of the artist's peak in value - age 67 for Cézanne, and 26 for Picasso.

Table 2 presents the comparable evidence for the same artists obtained from a survey of 31 textbooks published in French since 1963. The results are almost identical to those of Table 1. French scholars clearly agree that Cézanne's final decade was his greatest, and that Picasso was at his peak during his 20s. They equally consider Cézanne's best single year to have been at age 67, and Picasso's 26.

Examples: Ten Important Modern Painters

I have never had either a first or a second or a third or a fourth

> manner; I have always done what I wanted to do, standing loftily apart from the gossip and legends created about me by envious and interested people... If you think of all my exhibitions from 1918 until today you will see continual progress, a regular and persistent march towards those summits of mastery which were achieved by a few consummate artists of the past.
>
> Giorgio de Chirico, 1962[89]

The use of the two measures of artist life cycles just described can be illustrated more generally with some additional examples. Evidence for the two measures for 10 important modern painters is given in Table 3.

The evidence of both prices and illustrations places Camille Pissarro's best period in his mid-40s. Pissarro was one of the core group of landscape painters - with Monet, Renoir, and Sisley - who pioneered the development of Impressionism. The greatest achievements of this group are widely recognized as having come in the 1870s, when Pissarro was in his mid-40s. During that decade the impact of the group's discoveries was so great that nearly all of Paris' advanced artists, including painters as disparate as Manet, Cézanne, Gauguin, and van Gogh, were lured into experiments with their methods. Impressionism was quintessentially a visual innovation, aimed at capturing "fugitive impressions of nature," and both Pissarro's goals and his methods identify him as experimental.[90] His art was visual, and he needed attractive views. Looking for a new home in 1883, he complained of the ugliness of one town: "Can a painter live here? I should have constantly to go off on trips. Imagine! No! I require a spot that has beauty!"[91] Pissarro struggled with finishing his paintings, as for example in 1895 he wrote to his son that he had nearly completed a series of large paintings, but confessed that "I am letting them lie around the studio until I find, at some moment, the final sensation that will give life to the whole. Alas! while I have not found this last moment I can't do anything further with

them."[92] Both types of evidence in Table 3 similarly place Edgar Degas' best period in his mid-40s. Degas often expressed his belief in repetition, saying "One must redo ten times, a hundred times the same subject," because of his perennial dissatisfaction with his achievements.[93] His dealer Ambroise Vollard observed that "the public accused him of repeating himself. But his passion for perfection was responsible for his continual research."[94] A friend, the poet Paul Valéry, wrote that "I am convinced that [Degas] felt a work could never be called *finished*, and that he could not conceive how an artist could look at one of his pictures after a time and not feel the need to retouch it."[95] Degas' studies of ballet dancers are an example of a large body of work in which his experimental innovations in the representation of space emerged gradually, so although the series is famous as a whole it lacks any one or two particularly famous landmark works. As Degas' friend, the critic George Moore, observed, "He has done so many dancers and so often repeated himself that it is difficult to specify any particular one."[96]

The quantitative measures of Table 3 place Wasily Kandinsky's best work around the age of 50, during the late 1910s, when he was pioneering an abstract art. In spite of Kandinsky's writings on metaphysics, the inspiration for his art was visual, and his development of it experimental. He himself described the visual origins of his recognition of the potentialities of non-representational painting, recalling an evening in 1910 when he returned to his studio around dusk and was startled to see "an indescribably beautiful picture, pervaded by an inner glow." On approaching the mysterious painting he discovered that it was one he had done earlier, standing on its side. This experience prompted him to set out on a search for forms that could be expressive even though unrelated to real objects. As he emphasized, however, he did not achieve this goal quickly, for "Only after many years of patient toil and strenuous thought, numerous

painstaking attempts, and my constantly developing ability to conceive of pictorial forms in purely abstract terms, engrossing myself more and more in these measureless depths, did I arrive at the pictorial forms I use today, on which I am working today and which, as I hope and desire, will themselves develop much further."[97] In considering the three great pioneers of abstract art, John Golding contrasted the progression of the experimental artists Kandinsky and Mondrian with that of the conceptual Malevich: "It might be fair to say that Malevich's abstraction sprang, Athena-like, ready formed from the brow of its creator; this distinguishes Malevich's approach very sharply from that of both Mondrian and Kandinsky, who had sensed and inched their way into abstraction over a period of many years."[98]

The difference of nine years between the two measures of Georgia O'Keeffe's best work in Table 3, while not extreme, is indicative of the absence of specific breakthrough years that resulted from her experimental approach. From the beginning of her career O'Keeffe often painted particular subjects in series. She explained that "I work on an idea for a long time. It's like getting acquainted with a person, and I don't get acquainted easily."[99] The series generally involved a progression: "Sometimes I start in very realistic fashion, and as I go from one painting to another of the same thing, it becomes simplified till it can be nothing but abstract."[100] But her persistence was nonetheless a product of dissatisfaction. Over a period of 15 years, she painted a door of her house in New Mexico more than 20 times. She explained that "I never quite get it. It's a curse - the way I feel I must continually go on with that door."[101] Her experimental attitude toward art led her to distrust the idea of the individual masterpiece: "Success doesn't come with painting one picture. It results from taking a certain definite line of action and staying with it." Not surprisingly, this led her to believe that artists must mature

slowly: “Great artists don’t just happen... They have to be trained, and in the hard school of experience.”[102]

The quantitative measures of Table 3 for Jean Dubuffet agree only that he did his best work after the age of 45. Dubuffet’s art was visual, as his goal was to draw on a variety of types of art by the self-taught or untrained to break with traditional concepts of artistic beauty and create an art that represented the viewpoint of the common man. He devoted considerable effort to devising new technical procedures to achieve this, including the use of accidental effects. During the 1950s, for example, he produced works he called assemblages by cutting up and reassembling painted surfaces. He explained that this technique, “so rich in unexpected effects, and with the possibilities it offers ... of making numerous experiments, seemed to me an incomparable laboratory and an efficacious means of invention.”[103] Describing him in the late 1950s a critic observed that “the level of [Dubuffet’s] work to date was uncommonly even,” and this assessment can clearly be extended much further.[104] There are no individual celebrated master works or pronounced peaks in Dubuffet’s remarkably long career, but instead an outpouring of a large body of work that evolved over time but that was nonetheless unified by a distinctive philosophy and approach.

Turning to the conceptual artists in Table 3 shifts our attention to a different type of career, in which artists’ major contributions appear precipitously, and generally at an earlier age. The quantitative measures for Edvard Munch both point to a peak period early in his 30s, during which he was systematically using insights he had gained from the work of Gauguin and other Symbolists to express his own states of mind. Munch’s most famous single work, and one of the most celebrated paintings of the late 19th century, was developed from a series of sketchbook

drawings, and then was worked out in pastel, before being painted in oils. That painting, *The Scream*, uses distortions of perspective and of shapes to create a visual image of extreme anxiety. As Munch recorded the experience that inspired the painting, as he walked one day at sunset: "Suddenly the sky became a bloody red ... I stood there, trembling with fright. And I felt a loud, unending scream piercing nature..."[105] Both Munch's goal of expressing emotions and his routine use of preparatory studies mark him clearly as a conceptual innovator. Although he lived past the age of 80, he never again produced work as powerful, or influential, as that of his youth.

The auction market and the textbooks, both English and French, agree that André Derain produced his most important work in his mid-20s. This was during a short span of time, 1904-06, when Derain joined Matisse, Vlaminck, and several other young artists in the invention and practice of Fauvism. The movement extended Symbolism, which had developed during the late 19th century, to a logical extreme through the use of bright, exaggerated color, flattened images, and visible brushwork. Recognizing the conceptual basis of the art, Derain later admitted that "We painted with theories, ideas."[106] Fauvism was the most short-lived of major movements in modern art, as Derain and his friends largely abandoned it within little more than three years. Derain thereafter began to work in a Cubist style before painting for many decades in a more conservative manner that led him to be "displaced from the center of the progressive effort." Historian George Heard Hamilton concludes that "the tragedy of André Derain, if such it was, lay in the discrepancy between his early promise and his later ambitions," and this may be an epitaph not only for Derain, but for a number of conceptual innovators who have become prominent by making a dramatic early contribution but have been unable to follow it with comparable later innovations.[107]

Georges Braque was a minor member of the Fauve movement, but the measures of Table 3 show that his greatest work came a few years later, when he was in his late 20s. This was of course when he joined Picasso in developing Cubism, as from 1909 until Braque joined the French army in 1914 the two worked together "like two mountaineers roped together."[108] As noted earlier, Cubism was a conceptual innovation in which the artists expressed their full knowledge of objects, without being bound by the constraint of what they could see of an object from a single location. Thus Braque ridiculed the single viewpoint of Renaissance perspective, saying "It is as if someone spent his life drawing profiles and believed that man was one-eyed."[109] Although he was wounded in World War I, Braque painted for many years afterwards, but he never again worked with Picasso. His later work is more highly regarded than that of Derain, but it produced no further major innovations, as up to the age of 80 and beyond Braque continued to work within a Cubist style that he had largely worked out by the age of 30.

Picasso admitted one other young painter, Juan Gris, into his and Braque's inner circle of Cubism in 1911. Gris contributed to the development of the later, Synthetic phase of Cubism, and all the evidence of Table 3 places his best work in the short span of time just after he began working with Picasso and Braque. The critic Guillaume Apollinaire called Gris a "demon of logic" for his effort to make Cubism a more systematic and rigorous form. Instead of beginning with fragments of objects and building compositions, like Picasso and Braque, in Gris' "deductive method" abstract compositions were plotted out in advance, with shapes and positions often calculated mathematically or constructed with a compass, and objects were then fitted into this framework.[110] Historian Christopher Green observed that Gris' planning for his paintings was followed by "an immaculacy of oil technique that masked utterly the trace of

process," while John Golding described Gris' *papier collés* as having a look of "tailor-made precision," equally a consequence of Gris' meticulous preparation.[111] Gris' goals also revealed his conceptual attitude, as in 1919 he wrote to his dealer and friend Daniel-Henry Kahnweiler that "I hope to be able to express an imagined reality with great precision using the pure elements of the mind."[112] Although Gris died prematurely, at the age of just 40, his most innovative work was already more than a decade in the past.

Giorgio de Chirico arrived in Paris in 1911, at the age of 23, and during the next six years produced a series of strikingly original paintings in which he sought to paint imagined scenes that would give art the clarity "of the dream and of the child mind." He called these works metaphysical, and the poet André Breton, the founder and leader of the Surrealist movement, considered them the most important twentieth-century inspiration for Surrealist painting.[113] After serving in the Italian army in World War I, de Chirico remained in Italy, and changed his style dramatically under the influence of his study of the work of a number of Old Masters. Historian James Thrall Soby observed that de Chirico's adoption of a neo-classical, academic style led abruptly to his "collapse ... as an original, creative artist."[114] The change also led to a falling out with the Surrealists. Breton continued to praise de Chirico's early work, but denounced the paintings he did after World War I. The Surrealists tried to induce de Chirico to return to his earlier style, but he resisted; Soby argues that his inspiration had disappeared, as "the hallucinatory intensity of his early art was spent."[115] De Chirico's curious reaction against the Surrealists' continued attacks on him led him not only vehemently to denounce modern art, but to produce numerous exact copies of the great early paintings that had established his reputation. By falsely dating these copies, de Chirico became a forger of his own early work.

Whether motivated by spite or financial gain, de Chirico was never able to establish the superiority of his late over his early work. Although he continued to paint until his death at 90, as the measures of Table 3 suggest, de Chirico's reputation rests almost entirely on the paintings he produced in his mid-20s, which directly influenced almost every important Surrealist painter.

This brief examination of the careers of ten important modern artists serves to illustrate the value of measuring systematically, and in several ways, the timing of artists' major contributions. Although many more artists could be considered, these cases demonstrate that the auction market and textbook treatments tend to agree quite closely on when painters produced their best work. Table 3 also shows how sharply the careers of experimental artists can differ from those of conceptual innovators, as for the artists included all the measures indicate that the experimental painters produced their best work beyond the age of 40, whereas the conceptual artists had generally reached their peaks by the age of 30.

Retrospective Exhibitions

> "Jasper Johns: A Retrospective" is the most significant survey of this artist's work ever organized, a full and clear mapping of his four decades of exploration, traced in paintings, drawings, prints, and sculptures.
>
> Geoffrey C. Bible, 1996[116]

Unlike textbook illustrations, which are most often chosen to represent the author's judgment of an artist's most important work, systematic critical evaluations of the relative quality of artists' work over their course of their entire careers are implicit in the composition of retrospective exhibitions. Museum curators who organize retrospective exhibitions reveal their judgments of the importance of an artist's work at different ages through their decisions on how many paintings to include from each phase of the artist's career. The distribution by age at

execution of an artist's works that are included in these exhibitions can consequently serve as a third quantitative measure of artists' careers.

Retrospectives are often organized by a single curator, and it might consequently be objected that their composition is an unreliable guide to an artist's career because it is subject to idiosyncratic preferences or simply ignorance. Yet organizers of major retrospectives normally work with many other art historians, both within and outside their own institutions. The composition of a retrospective therefore typically represents the collective judgment of a group of scholars. In general, it also appears that the larger the museum arranging the retrospective, the greater the number of scholars who work to assemble and analyze it. Retrospectives presented by major museums may consequently be least subject to this criticism. Important artists are usually given retrospectives by wealthy museums, so for the painters considered here retrospectives can generally be assumed to represent careful and considered reviews of their careers.

Table 4 presents the age distributions of the works included in the most recent full retrospective exhibitions for Cézanne and Picasso. These closely resemble the age distributions of textbook illustrations of the two artists' work shown above in Tables 1 and 2. For both artists the retrospectives' age distributions are slightly less skewed toward the peak ages, and this is to be expected since one obvious purpose of these exhibitions is to illustrate the artist's work at all stages of his career. But it is nonetheless clear that the Cézanne respective gave its greatest emphasis to his final decades, and that the Picasso exhibition gave the greatest weight to his early years. The single years most heavily emphasized by the retrospectives - age 67 for Cézanne, and age 26 for Picasso - were precisely the same as the estimated ages at peak value for

both artists, and were therefore also the same ages most heavily represented in both the American and French textbooks.

Retrospectives may less often be useful for earlier modern artists than for more recent artists. The paintings of earlier great modern artists, like Cézanne and Picasso, have become so valuable, and are in many cases so important in attracting visitors to museums' permanent collections, that full retrospective exhibitions of their work are rarely held. Thus although parts of these artists' careers are frequently featured in special exhibitions, comprehensive retrospectives are rarely mounted. The Cézanne exhibition used for Table 4 was held in 1996, but it was the first full survey of his work since 1936, and the Picasso retrospective used for Table 4 was held more than 20 years ago, in 1980. This is less true, however, for important artists of the more recent past. Thus for example just within the past ten years comprehensive retrospectives have been held for such important artists of the post-World War II era as Jasper Johns, Willem de Kooning, Roy Lichtenstein, Jackson Pollock, Robert Rauschenberg, and Mark Rothko. Retrospective exhibitions can consequently be a particularly valuable source for studying the careers of recent modern artists.

Examples: Ten Important American Painters

> We believe that we can find the end, and that a painting can be finished. The Abstract Expressionists always felt the painting's being finished was very problematical. We'd more readily say that our paintings were finished and say, well, it's either a failure or it's not, instead of saying, well, maybe it's not really finished.
>
> Frank Stella, 1966[117]

The effect of adding the evidence of retrospective exhibitions to the two measures used earlier can be demonstrated by considering the careers of ten prominent members of the two

generations of American painters who dominated modern art after World War II. The first of these generations was dominated by experimental innovators, and the second by conceptual innovators.

The first five artists listed in Table 5 are the leading members of the Abstract Expressionists. This was a group united not by a style but by a desire to draw on the subconscious to create images, and all the members of the group used an experimental approach. The absence of preconceived outcomes was a celebrated feature of Abstract Expressionism. Jackson Pollock's signature drip method of applying paint, with the inevitable puddling and spattering that could not be completely controlled by the artist, became the trademark symbol of this lack of preconception, reinforced by his statement, "When I am *in* my painting, I'm not aware of what I'm doing."[118] Mark Rothko wrote that his paintings surprised him: "Ideas and plans that existed in the mind at the start were simply the doorway through which one left the world in which they occur."[119] Barnett Newman expressed the same idea less dramatically: "I am an intuitive painter ... I have never worked from sketches, never planned a painting, never 'thought out' a painting before."[120] Arshile Gorky's widow recalled that he "did not always know what he intended and was as surprised as a stranger at what the drawing became ... It seemed to suggest itself to him constantly."[121]

The Abstract Expressionists developed their art by a process of trial and error. In 1945 Rothko wrote to Newman that his recent work had been exhilarating but difficult: "Unfortunately one can't think these things out with finality, but must endure a series of stumblings toward a clearer issue."[122] This description applied equally to the production of individual paintings. Elaine de Kooning recalled that her husband repeatedly painted over his canvases: "So many

absolutely terrific paintings simply vanished because he changed them and painted them away."[123] An assistant who worked for Rothko in the 1950s remembered how he "would sit and look for long periods, sometimes for hours, sometimes for days, considering the next color, considering expanding an area;" a biographer observed that the extent of these periods of study was such that "since the late 1940s Rothko, building up his canvases with thin glazes of quickly applied paint, had spent more time considering his evolving works than he had in the physical act of producing them."[124] Like the other Abstract Expressionists, Rothko believed that progress came slowly, in small increments. He made his trademark image of stacked rectangles the basis for hundreds of paintings over the course of two decades, declaring that "If a thing is worth doing once, it is worth doing over and over again - exploring it, probing it."[125]

With enormously ambitious but extremely vague goals, the Abstract Expressionists were continually uncertain not only whether their paintings were successful, but even whether individual works were finished. Newman declared simply that "I think the idea of a 'finished' picture is a fiction."[126] De Kooning recalled that he considered his series of paintings of *Women* - now generally considered his most important achievement - a failure, but that hadn't fazed him: "In the end I failed. But that didn't bother me ... I didn't work on it with the idea of perfection, but to see how far one could go - but not with idea of really doing it."[127] Pollock's widow, Lee Krasner, recalled that during the early 1950s, even after he had been recognized as a leader of the Abstract Expressionists, one day "in front of a very good painting ... he asked me, 'Is this a painting?' Not is this a good painting, or a bad one, but a *painting*! The degree of doubt was unbelievable at times."[128]

The Abstract Expressionists came to dominate American art during the 1950s, and many

younger artists directly followed their methods and goals. Yet some aspiring artists found the art and attitudes of the Abstract Expressionists oppressive. Reacting against what they considered the exaggerated and pretentious emotional and philosophical claims of Abstract Expressionism, these younger artists created a variety of new forms of art. Although these new approaches did not belong to any single movement or style, they shared a desire to replace the complexity of Abstract Expressionist gestures and symbols with simpler images and ideas. In the process, during the late 1950s and the '60s, they succeeded in replacing the experimental methods of the Abstract Expressionists with a conceptual approach.

These younger artists planned their work carefully in advance. Frank Stella explained that "the painting never changes once I've started to work on it. I work things out beforehand in the sketches."[129] Roy Lichtenstein prepared for his paintings by making drawings from original cartoons, then projecting the drawings onto canvas and tracing these projected images to create the outlines for the figures in his paintings. Although Lichtenstein's cartoon paintings were very different from Stella's geometric patterns, in 1969 Lichtenstein specifically compared the central concern of his work to Stella's: "I think that is what's interesting people these days: that before you start painting the painting, you know exactly what it's going to look like."[130]

These artists wanted the images in their work to be clear and straightforward. Stella emphasized that "all I want anyone to get out of my paintings ... is the fact that you can see the whole idea without any confusion."[131] Jasper Johns explained that he chose to paint flags, targets, maps, and numerals because "they seemed to me preformed, conventional, depersonalized, factual, exterior elements."[132] Some of the artists produced their paintings, or had them produced, mechanically. Andy Warhol used silk screens because "hand painting

would take much too long and anyway that's not the age we're living in. Mechanical means are today."[133] Lichtenstein mimicked mechanical production: "I want my painting to look as if it had been programmed. I want to hide the record of my hand." He stressed the contrast with his predecessors: "Abstract Expressionism was very human looking. My work is the opposite."[134]

These younger artists emphatically rejected the emotional and psychological symbolism that the Abstract Expressionists had considered central to their art. Stella told an interviewer:

> I always get into arguments with people who want to retain the old values in painting - the humanistic values they always find on the canvas. If you pin them down, they always end up asserting that there is something there besides the paint on the canvas. My painting is based on the fact that only what can be seen there *is* there.[135]

Similarly, when asked if he was anti-experimental, Lichtenstein replied, "I think so, and anti-contemplative, anti-nuance, anti-movement-and-light, anti-mystery, anti-paint-quality, anti-Zen, and anti all those brilliant ideas of preceding movements which everyone understands so thoroughly."[136]

A generation dominated by experimental artists was thus followed by one dominated by conceptual artists. Many implications of this shift have been discussed by art critics and historians. Yet what has not received systematic attention from art scholars is the consequences of the shift for artists' life cycles. The three measures introduced above are presented in Table 5 for the leading members of each of the two generations.[137]

A comparison of the three measures shows that they agree quite closely on when each individual artist produced his best work. The age at which an artist did his work of peak auction value is never more than eight years away from either the age of most textbook illustrations or

the age most heavily represented in the artist's retrospective exhibition, and for eight of the ten artists this difference is five years or less. The three measures all clearly agree on the phases of their careers when these artists made their major contributions.

Table 5 also shows that the generational shift from experimental to conceptual innovators was accompanied by a sharp drop in the ages at which artists produced their best work. All three measures agree that Pollock's best period was in his late 30s, and that the other Abstract Expressionists' peaks all came after the age of 40. In contrast, of the next generation the three measures place Lichtenstein's peak in his late 30s, and those of the other four artists from their mid-20s to their early 30s.

Museum Collections

> Artists of genius are few in number... [T]he museum collection aspires to show a chronological sequence of the work of such artists, carrying forward an argument which forms the material of any history of modern art.
>
> Alan Bowness, 1989[138]

The decisions of museums, even apart from their assembly of retrospective exhibitions, are another source of information on artists' major contributions. Museums wish to present the best work of the most important artists, and they consequently reveal their judgments of what this best work is in a number of ways. One is through their decisions on what to display. Most museums have the space to exhibit only a small fraction of all the paintings they own at any given time. Curators' decisions of what paintings to display therefore indicate what they consider the most important among the works available to them. These selections are of course constrained by the contents of the museums' collections. But the greatest museums, with the largest and best collections of the work of major artists, will be the least constrained in this way.

The paintings these museums choose to hang will consequently tend to communicate their curators' judgments about when artists produced their best work.

A related source of information on curators' judgments is even more readily accessible. Nearly all major museums now publish illustrated books presenting their collections to the public. These books vary in size, but often serve as highly selective introductions to what the museums judge to be their best works. An example of how these books can be used is afforded by *An Invitation to See*, the revised edition of which was published in 1992 by New York's Museum of Modern Art, and which contains photographs and brief discussions of 150 works selected from the museum's collection.[139] For the same artists included in Tables 3 and 5, Tables 6 and 7 present the ages of the artists when they executed those of their works included in *Invitation to See*.

In Table 6, the median age of Degas, Kandinsky, O'Keeffe, and Dubuffet - the four experimental artists from Table 3 included in *Invitation to See* - when they executed the eight paintings reproduced in the book was 48 years, whereas the median age of the conceptual innovators Derain, Braque, Gris, and de Chirico when they produced the six of their paintings treated in the book was just 29.5 years. Table 7 shows that the six paintings of the Abstract Expressionists reproduced in *Invitation to See* were made by the artists at a median age of 44.5, whereas the six reproduced works by the five conceptual painters of the next generation were made at a median age of just 30.5. In addition, *Invitation to See* includes three paintings by Cézanne, executed at a median age of 59, and ten works by Picasso, done at a median age of 36. Analysis of the Museum of Modern Art's own selection of works from its collection therefore demonstrates that the museum's curators strongly agree that the experimental artists considered

here produced their most important work considerably later in their careers than did the conceptual innovators.

The Museum of Modern Art is known for the strength of its collection of American paintings of the post-World War II era.[140] In view of this, it is striking to note how closely the Museum's selection of works by the artists in Table 7 agrees with the auction market. Of the 12 paintings illustrated in *Invitation to See* by these 10 American artists, none was made more than seven years from the respective artist's estimated age at peak value, 10 of the 12 were made within five years of that age, and fully half were made within just two years of the age at peak value.

Systematic measurement of the quality of artists' work over the course of their careers is a recent development, so it is perhaps not surprising that art historians are not widely aware of how, and how well, it can be done. It is clear, however, that art historians had not anticipated that such measurements were possible - and, unfortunately, that they continued to deny the possibility of these measurements even after they had begun to appear. Thus for example as recently as 1998, a curator at New York's Museum of Modern Art declared that an artist's success "is completely unquantifiable."[141] This paper's survey of methods of measurement, and illustrations of their use, demonstrate clearly that this curator was wrong, and that artistic success can be measured, not only with evidence drawn from the auction market and from textbooks of art history, but even from decisions made by the curators of his own museum. The consistency of the evidence from this remarkably wide variety of sources on the hypothesis examined here constitutes powerful evidence not only that conceptual artists arrive at their major contributions at younger ages than their experimental counterparts, but also that, as Clement Greenberg

asserted, there is a strong consensus among those in the art world on what is important in art.

The variety of methods by which artists' careers can be quantified is valuable, as noted above, for checking and reinforcing the validity of any single measurement. It is also valuable, however, for cases in which some sources of evidence are unavailable for an artist of interest. Marcel Duchamp produced very few works of art during his career, and only nine of his paintings came to auction during 1970-97, a number much too small to support meaningful statistical analysis. Yet Duchamp's work plays an important role in the development of modern art, and consequently has been examined intensively by textbooks and museums. The timing of his principal innovation emerges clearly from these sources. The surveys of both the American and French textbooks described above identify 1912, when Duchamp was 25 years old, as the most important year of his career, represented by the most illustrations.[142] *An Invitation to See* reproduces two works by Duchamp, executed in 1912 and 1918, when Duchamp was 25 and 31 years old, respectively. Since Duchamp lived past the age of 80, this concentration on his early work strongly suggests that his principal innovation was conceptual. The text of an *Invitation to See* immediately indicates this. The first sentence of the book's discussion of *The Passage from Virgin to Bride* (1912) reads: "While still in his twenties, Duchamp determined to get away from the physical aspect of painting in order to create ideas rather than mere 'visual products.'" To emphasize that Duchamp's goal was a conceptual one conceived at an early age, the first sentence of the same book's discussion of his *To Be Looked at (From the Other Side of the Glass) with One Eye, Close To, for Almost an Hour (1918)* again made this point: "While still in his twenties, Duchamp determined to get away from the physicality of painting and 'put painting once again at the service of the mind' by creating works that would appeal to the intellect rather

than to the retina."[143] These sources thus leave little doubt that art scholars judge Duchamp to have been a conceptual young genius rather than an experimental old master.

The Spectrum of Approaches

> If the artist carries through his idea and makes it into visible form, then all the steps in the process are of importance ... All intervening steps - scribbles, sketches, drawings, failed works, models, studies, thoughts, conversations - are of interest. Those that show the thought process of the artist are sometimes more interesting than the final product.
>
> Sol LeWitt, 1967[144]

Before examining some important implications of this analysis of artists' life cycles, it is useful to consider in more detail the nature of the categorization being done here. To this point, the distinction between conceptual and experimental approaches has been treated as binary. Yet as in virtually all scientific analysis, the true distinction between these concepts is not qualitative but quantitative. This does not mean the binary distinction is not valid, or useful; as the preceding empirical measurements have illustrated, the distinction is valuable in understanding artists' careers. The usefulness of the distinction is analogous to the value of the distinction made by economists between theorists and empiricists. Although we recognize that much, if not most, research is based on both theory and evidence, it is rarely difficult to identify in which area any particular work makes its primary contribution.

Economists often speak colloquially of high-brow and low-brow theorists, in order to refer to differences in the degree of abstraction the scholar typically uses. In similar fashion, we can ask not only how to distinguish conceptual from experimental artists, but how to understand systematic differences in the practices of artists within both groups. Doing this may help us to gain a better understanding of artists' life cycles, and it is likely to give us a deeper appreciation

for the problems modern artists have confronted, and how they have solved them.

For present purposes, I propose to distinguish between two types of practitioner - extreme and moderate - within both the conceptual and experimental approaches. One dimension along which many artists can be arrayed with some confidence is the degree to which they make decisions about a work of art before as opposed to during the execution of the final work. This is the dimension I will primarily consider here.

Taking first conceptual artists, it might seem that extreme practitioners are most readily described and identified: they are artists who make all the decisions for a work before beginning it. It is unclear, however, if this practice is literally possible. There are artists who came close to it, and perhaps achieved it, during the 1960s, by making plans for their work and having these plans executed by others. The artists often did this not simply by describing a desired image, but by specifying the process by which the work was to be made. Yet even in these cases the artists often supervised the execution, and in most cases retained the right of approval of the final work - thus continuing to make decisions, or at least retaining the option of making decisions, after the planning stage. Andy Warhol approached the extreme of complete preconception in the silk-screened paintings based on photographs that he began to do with his assistant Gerard Malanga in 1962. Warhol would begin by selecting a photograph from a magazine or newspaper. He then sent this to a silkscreen manufacturer with instructions about the size of the screens and the number of colors he wished to use. The printers would then deliver the screens to Warhol's Factory.[145] An assistant would then press a variety of inks through these screens to create the image on canvas. Warhol sometimes helped; Gerard Malanga explained that "When the screens were very large, we worked together; otherwise, I was pretty much left to my devices." Yet

Warhol's intent was apparently to accept all the paintings produced in this way. Thus Malanga recalled that:

> Each painting took about four minutes, and we worked as mechanically as we could, trying to get each image right, but we never got it right. By becoming machines we made the most imperfect works. Andy embraced his mistakes. We never rejected anything. Andy would say, "It's part of the art."[146]

Malanga's account suggests that no decisions were made by Warhol after the initial selection of the photographs and paints, though his use of the first-person plural might raise the question of whether Warhol also automatically accepted works made by Malanga working in Warhol's absence. Another approach to the extreme of complete preconception was described in Sol LeWitt's rules of 1971 for the execution of his wall drawings. LeWitt stipulated that the artist planned the drawing, which was then realized, and interpreted, by a draftsman. LeWitt recognized that "The draftsman may make errors in following the plan. All wall drawings contain errors, they are part of the work." Yet LeWitt left open the question of whether the artist was to play any role after the planning stage when he declared that "The wall drawing is the artist's art, as long as the plan is not violated."[147] Since LeWitt did not explain who would determine whether the plan was violated, or according to what criteria, his qualification left the possibility of a role for the artist after the planning stage.

Leaving aside these relatively minor questions about the practices of Warhol and LeWitt, it is clear that they should be classified as extreme conceptual artists. Yet for most of the modern era, having a painting executed entirely by someone other than the artist was not an option. Any artist making a painting obviously makes innumerable decisions in the process, as to what materials to use, where and when to work, and so on. Yet the real issue here does not concern

these routine procedural decisions, but rather the major decisions that have the greatest impact on the appearance of the finished work. In this regard it is possible to define an extreme conceptual painter as one who makes extensive preparations in order to arrive at a precisely formulated desired image before beginning the execution of the final work.

Clear examples of modern artists who created these precise preparatory images can be cited. Georges Seurat's preparations for his early masterpiece, *Sunday Afternoon on the Island of the Grande Jatte*, involved making more than 50 studies, including drawings, painted wood panels, and canvases.[148] The painting was considerably more complicated than his earlier major work, *Une Baignade à Asnieres*: "The greater complexity of the subject he planned to offset by completer documentation."[149] Seurat's preparations led to a painting approximately one-tenth the size of the final work, that has been titled "Definitive Study for 'La Grande Jatte.'"[150] By the time he executed the final canvas, he therefore knew precisely what he wanted to do:

> Standing on his ladder, he patiently covered his canvas with those tiny multi-colored strokes ... At his task, Seurat always concentrated on a single section of the canvas, having previously determined each stroke and color to be applied. Thus he was able to paint steadily without having to step back from the canvas in order to judge the effect obtained ... His extreme mental concentration also enabled him to keep on working late into the night, despite the treacherous character of artificial lighting. But the type of light in which he painted was unimportant, since his purpose was completely formulated before he took his brush and carefully ordered palette in hand.[151]

Henri Matisse's preparations for *Luxe, Calme, et Voluptè*, the large Divisionist painting he produced in 1905, occupied the entire preceding winter. He not only made a series of drawings and smaller oil paintings, but at the end of these studies he drew a full-scale cartoon, or charcoal drawing on paper, of the work. He then had his wife and daughter transfer this drawing

to canvas using the traditional technique of pouncing.[152] The use of this mechanical procedure clearly points to Matisse's wish to begin his painting from an unaltered replica of his final preparatory drawing.

The extensive preparations for these two major paintings, involving a large number of studies made over a considerable period of time, culminated in both cases in elaborate preparatory works that appear to signal that each artist had succeeded in making all the major decisions for his painting before he began to work on the final canvas. This identifies Seurat and Matisse as extreme conceptual painters.

To identify the opposite end of the spectrum being examined here, we can consider extreme experimental artists. Their description appears equally straightforward: these should be artists who make no decisions for a painting before beginning to create what will become the final work. This extreme is of course not literally possible. The artist must obviously make some preparations for a painting, by buying materials, having a place to work, and the like. But as above we can put aside these routine problems and consider only those decisions that significantly affect the specific appearance of the finished work.

We can readily find examples of modern artists whose goal it was to begin their works without conscious preconception. A number of Surrealist painters began their paintings with what they called automatic drawing. André Masson, for example, would begin a work by allowing his brush to move freely over the canvas. "Only after the drawing was well under way did Masson permit himself to 'step back' to consider the results."[153] The shapes he saw on the canvas would then suggest forms to him, and he would develop these into a finished image. Under the influence of the Surrealists, a number of the Abstract Expressionists also adopted

automatism as a device to begin their paintings. The most celebrated of these was Jackson Pollock. He explained in 1948 that he would tack an unstretched length of canvas on the floor, then begin to work by dripping paint on it from all four sides: "It is only after a sort of 'get acquainted' period that I see what I have been about."[154] Like Masson, Pollock would then examine the pattern on the canvas, and work toward developing this into a coherent composition. Pollock's avoidance of preconception was such that often it was not until he was in the final stages of working that he would decide how large the final painting would be, and how it would be oriented.[155]

Identifying the extremes of both approaches is thus relatively easy; the more difficult problem is to separate the moderate conceptual from the moderate experimental artists. Artists in both of these groups make some preparatory studies for their paintings, but these are not as extensive as the meticulous preparations of the extreme conceptual artists. Where do we then draw the dividing line between conceptual and experimental?

One resolution of this problem could be to consider other dimensions of the artists' work, including whether their goals are visual or ideational. This is obviously something we should do before making definite assignments of artists for whom there is any uncertainty regarding whether they preconceive their works. Yet it is worth working a bit more on the latter dimension before proceeding to other criteria. The test I would propose for separating moderate practitioners of the two types is whether their preliminary works suggest that they have in fact made the major decisions about the appearance of the images in their paintings before beginning to execute them.

Examples are obviously necessary to clarify this criterion. In 1860, Edouard Manet made

a preparatory drawing for a painting of his parents that he squared up for transfer to the canvas. The drawing's exact resemblance to the finished work and the squaring-up together indicate that Manet had precisely preconceived the double portrait.[156] On these grounds, we might identify Manet as a conceptual painter. Yet this painting dates from a period before Manet had made a major contribution, and he did not often make similar full compositional studies in later years. During 1862-3, however, Manet made a small number of drawings of reclining nudes that several scholars believe to have been explicitly related to his celebrated *Olympia* of 1863. Theodore Reff discusses four such drawings, and concludes that "none corresponds to the painting, whereas the final study, executed in watercolor over a swift pencil sketch, is virtually identical."[157] Reff's judgment is consistent with the observation of Manet's friend, the critic Theodore Duret, that "In his early years, his favorite method was to use watercolor for the preliminary studies for his pictures, in order to establish the proper color-scheme and composition."[158] The combination of a limited body of preparatory works with a single small study that closely resembles the finished painting, which itself ranks as one of his major achievements, situates Manet as a moderate conceptual innovator in this scheme.

Claude Monet serves as an example of a moderate experimental artist. In his study of Monet's technique, John House observed that Monet did make sketches and drawings to record possible compositions for his paintings, but argued that "they were not preparatory studies for individual paintings, but rather preliminary notations of possible viewpoints, a sort of repertory of potential subjects, which Monet might use in deciding which motifs to paint and how to frame a particular scene." The use of the sketches to identify a motif before beginning the final work means that Monet was not an extreme experimental artist: unlike Masson and Pollock, he had a

clear idea from the outset of what his subject was to be. Once Monet had selected a motif, however, the drawings played no additional role in the production of the final work: "Once he fixed on the viewpoint for a painting, the drawings would have no further use." House describes precisely why Monet's practice identifies him as an experimental artist according to the definition used here:

> His search for a promising subject completed, whether with or without the assistance of drawings, the moment of precise formulation came when Monet first confronted his bare canvas. The essential forms of a picture were generally established in the early stages of its execution, in an initial mapping out which often included elements of considerable complexity.[159]

Thus the specific formulation of the images in Monet's paintings was not determined before he began a painting, but during its execution.

Monet's goals often required him to make significant changes in his paintings during the working stage. House observed that:

> the execution of the canvas was not one continuous progression from the discovery of an interesting effect to its final pictorial realization. Difficulties might arise at any stage, and the variety of things that might go wrong helps to highlight the particular points in Monet's working process where decisions had to be taken.

Monet's working method also evolved over time:

> The frequency and extent of the pentimenti to be found in his paintings increase during the 1880s and 1890s - a further indication of the growing complexity of his methods during these years.[160]

Many of the changes in Monet's paintings were caused by his insistence on "painting directly in front of nature," as his scenes might change more quickly than he could capture them. This was sometimes caused by human agency, as when boats were moved on the beach at Etretat in

stormy weather, but it was often due to natural causes: "Water levels may be raised or lowered; the state of wind or waves may change; snow may be added or erased; the angle or quality of lighting may be transformed; and the seasons themselves may be altered."[161] Evidence of Monet's willingness to change his paintings in the course of their execution has been added by recent x-ray examination of some of his works. So for example in *On the Seine at Bennecourt*, executed in 1868, x-rays show that the figure of a child was painted out of an earlier version, and replaced by a dog. Similarly, x-ray analysis of his 1869 *Bathers at La Grenouillère* revealed a number of revisions in the composition made during its execution, and led a group of scholars from England's National Gallery to describe its production as "impulsive and experimental."[162] The evidence of these changes testifies to the sincerity of Monet's advice that "one ought ... never be afraid ... of doing over the work with which one is not satisfied, even if it means ruining it."[163]

Much more work remains to be done, in studying the practices of many more painters, before the scheme proposed here can be considered fully developed. Yet these examples suggest that it may be useful to consider the experimental-conceptual distinction not simply as a binary categorization, but rather as a quantitative difference. In this view there is a continuum, with extreme practitioners of either type at the far ends, and moderate practitioners of the two categories arrayed along the intermediate positions of the scale. The greatest difficulties in categorizing painters will obviously arise among the moderates of both groups, who may appear to be quite similar in their practices. Yet close examination may often allow them to be separated and classed clearly as experimental or conceptual, according to whether, in Reff's terms, any single preparatory work is "virtually identical" to the finished work, or whether, in

House's language, the "essential forms" of their pictures were established only during their execution.

The need for careful study of artists' methods in making these distinctions is occasioned by the fact that subtle differences in practices can be associated with sharp differences in artistic goals. At the start of his career as a painter, Paul Gauguin studied informally with Camille Pissarro. A recent monograph argued that Gauguin's temperament would not have attracted him to the direct approach of Monet, Renoir, or Sisley, but would have led him to prefer Pissarro's "careful preparation of the composition of a painting."[164] Consistent with this position, a recent analysis of Pissarro's method produced the conclusion that among the leading Impressionists, Pissarro was apparently "least comfortable with the direct rendering and informal compositions that characterized Impressionism in the early 1870s."[165] Neither Pissarro nor Gauguin can be placed at either of the extreme positions on the spectrum described here. Yet the significant question is whether both should be placed at the same intermediate position: did they share a moderate experimental or moderate conceptual approach? In fact the answer appears to be that they did not; a difference appears between the practices of teacher and student that places them at different positions within the middle range of the spectrum considered here, on opposite sides of the divide between experimental and conceptual. In 1886, Gauguin began to square up preparatory figure drawings for transfer to the canvas, and thereafter he regularly followed this process in preparing to paint the major figures in his paintings.[166] In contrast, although Pissarro accumulated scores of drawings of individual figures that he could place in his paintings as he desired, he rarely if ever transferred these drawings to the canvas by a mechanical process like squaring-up. Thus the authors of a study of Pissarro's drawings concluded that they were rarely

made for any specific projected painting, and that his preparatory process was "as experimental as the manner of painting itself."[167] Gauguin's desire to preconceive central elements in his paintings, and Pissarro's avoidance of doing so, appear symptomatic of the substantial difference that arose in their artistic goals and caused a rift between the two friends. Thus Gauguin emerged as a leading Symbolist painter in the late 1880s, having arrived at the belief that artists should not copy nature too closely, since "art is an abstraction."[168] In contrast, Pissarro remained steadfastly committed to the visual goal of "capturing the so random and so admirable effects of nature."[169] The contrast in their goals confirms the categorization, initially based on consideration of their preparation for their paintings, of Pissarro as a moderate experimental painter, and Gauguin as a moderate conceptual one.

An interesting issue related to the placement of artists on the experimental-conceptual spectrum concerns possible differences between their desired and actual practices. A variety of constraints, including existing technology as well as artists' abilities, may prevent artists from achieving the degree of preconception of their work that they would like. An apparent example has been revealed by recent research. Thomas Eakins was a quintessential extreme conceptual artist. He planned his paintings meticulously, regularly making preparatory drawings of individual figures, elaborate perspective studies, and eventually full compositional studies for his paintings, which he then transferred to canvas through the use of a grid. Eakins was so committed to achieving representational accuracy that when possible he would borrow from boatbuilders the plans they had used to build the boats he painted.[170] A great deal of attention has recently been given to the discovery by two conservators that Eakins began a number of paintings by projecting photographic images onto his canvases, which he then traced to establish

the contours for figures and objects.[171] Much less attention has been devoted to another finding of the conservators, however. In examining Eakins' paintings, they found an element for which his procedures contrasted sharply with the careful preconception of his compositions. Thus they observed that Eakins "often followed an indirect course of successive approximations toward a harmonious arrangement and ordering of color." Color frustrated Eakins, for it posed complicated problems that he could not solve to his satisfaction in advance. Early in his career he complained of his inability to use color without the need to "change & bother, paint in & out." Color presented problems that were extremely complicated: "there is the sun & gay colors & a hundred things you never see in a studio light & ever so many botherations that no one out of the trade could ever guess at." Lacking a satisfactory way of determining color relationships before he began a painting, Eakins followed a systematic process in which he applied layers of paint, working incrementally from brighter to darker colors in the course of executing a painting. Eakins clearly considered this working by stages to be the lesser of two evils. Thus he was appalled at Delacroix's attempts "to seek the tones throughout his painting at the same time;" he found the results "abominable," and attributed this to the fact that Delacroix worked intuitively, and thus "didn't have any process" to find the proper color relationships.[172]

Eakins' response to the problem of color is intriguing and suggestive. It demonstrates that even extreme conceptual artists may be unable to plan their works as completely as they would like. Eakins' solution was to design a process that advanced systematically, and thus minimized the impact of any single decision that had to be made during the process of execution. This example appears to open up a wider research agenda, of examining how other conceptual artists have coped with obstacles that prevented them from preconceiving their works as

thoroughly as they would have liked.

Much work remains to be done before the continuum described here can be used with confidence. A key question in determining the value of this work will involve the implications of the analysis for understanding artists' life cycles. As surveyed earlier in this paper, there is very strong evidence that artists' creativity over the life cycle is systematically related to their approach, when the approach is simply measured qualitatively, as conceptual or experimental. Will the finer categorization discussed in this section add even greater explanatory power to the study of life cycles? There is currently not sufficient evidence to begin to answer this question. One conjecture might be made, however. Specifically, it might be hypothesized that extreme conceptual artists will tend to achieve their major contributions earlier in their careers than any other type of innovator. The basis of this hypothesis is that these artists' innovations may tend to be both the most radical and the least complex. The former effect is a product of lack of experience, and consequent freedom from acquired restrictions on extreme departures in the form of habits of thought, while the latter means that the innovations can often be realized with only minimal requirements for acquired skills. But until much more research is done to classify many more artists with precision, this must be considered no more than an untested conjecture.

Can Artists Change?

> Seurat has something new to contribute ... I am personally convinced of the progressive character of his art and certain that in time it will yield extraordinary results.
>
> Camille Pissarro, 1886[173]

> Seurat, who did indeed have talent and instinct, ... destroyed his spontaneity with his cold and dull theory.
>
> Camille Pissarro, 1895[174]

As is the case for practitioners of other intellectual disciplines, it appears that the typical pattern is for artists to find the approach that best suits them in the course of arriving at their mature style. The approach they settle on may not be the one in which they were originally trained. Thus since the time of the Impressionists, many modern artists who have studied in academies have been taught to make careful preparatory studies for their paintings, but after leaving their schools have discovered that they preferred to work without fully preconceived images. So for example John Rewald observed of Cézanne that "He hardly ever did preliminary sketches, since his canvases are not the product of a long, abstract reflection but the result of direct observation which did not allow such preparations."[175] This of course applies to the mature artist. Cézanne in fact made four sketches, a watercolor, and two compositional studies for *The Abduction* of 1867, two preparatory drawings for his *Portrait of Achille Emperaire* of 1870, and at least six preparatory drawings and a compositional study for *The Feast* of 1872.[176] Yet these paintings were made before Cézanne traveled to Pontoise later in 1872, where under Pissarro's influence he began to paint directly from nature, and ceased to make preparatory drawings for his paintings. This practice suited him, and he followed it with few exceptions thereafter.

Some artists have also changed in the opposite direction in the course of arriving at their mature styles. So for example Paul Signac worked under the influence of Impressionism early in his career. It was only after he met Georges Seurat that he quickly discovered that he preferred a conceptual approach, and that he began to plan his paintings carefully in advance, the practice he followed for the rest of his life.[177]

But artists' changes in practice in the course of arriving at their mature styles, whenever

that occurs, are not at issue here. The significant question about changes in approach is whether artists can make important, mature contributions in both experimental and conceptual approaches at different stages of their careers.

This question has never been posed directly before, so no systematic research has been aimed specifically at producing evidence that bears on it. Surveying many available detailed analyses of the careers of individual artists suggests that there have been few who have attempted to change their approach after arriving at a mature style. Yet some artists' careers do show indications that they may have made a genuine change over time from one approach to the other, and in at least one well-documented case an important artist specifically tried and failed to change approaches. A few examples can briefly be considered here.

Edouard Manet was classified in the preceding section as a moderate conceptual artist, on the basis of the preparatory studies he did for paintings of the 1860s, including his famous *Olympia* of 1863. This was evidently not an uncommon practice for Manet around this time.[178] Yet as is well known, Manet's art changed considerably during the 1870s; one element of this was that "From 1870 on, Manet seldom felt the need to elaborate a preliminary composition in drawing form."[179] Nonetheless, there are specific drawings from the 1870s that are "reproduced practically unchanged in design and detail, in the medium of oils."[180] X-ray analysis of Manet's last great work, *A Bar at the Folies-Bergère*, completed in 1882, reveals that he twice shifted the position of the reflection of the barmaid who is the painting's central subject. These changes made in the course of executing the painting appear to be a prime source of the visual contradiction between the placement of the barmaid and the mirrored reflection of her encounter with a customer that has made the painting a source of a vast amount of scholarly inquiry and

debate. Thus an oil study Manet had made in preparation for the painting, which appears to have served as his point of departure for the final version, presents much less exaggerated distortions from a realistic portrayal of the scene.[181] It is possible that the important modifications Manet made in the course of working on his final masterpiece serve as evidence that during the 1870s he had in fact evolved from his early moderate conceptual approach to a moderate experimental one, as in this time his "solution to composition became increasingly bound to the act of seeing or experiencing a motif or a scene directly."[182]

Together with his friends Claude Monet, Auguste Renoir, and Alfred Sisley, Camille Pissarro was a member of the core group of Impressionists who developed new ways of portraying nature, and influenced virtually every advanced artist in Paris during the 1870s. Like his friends, however, Pissarro suffered from the uncertainty that is typical of experimental artists, and during the 1880s he became increasingly dissatisfied with his art. Thus in 1883 he confessed to his son Lucien that "I am much disturbed by my unpolished and rough execution; I should like to develop a smoother technique."[183] In 1885 Pissarro, then 55 years old, met Georges Seurat, who was just 26. Pissarro was quickly converted to Seurat's ideas and techniques, and began to use them himself. During the next few years, Pissarro's attempts to follow Seurat apparently involved not only using smaller brushstrokes and pure contrasting colors that were intended to achieve more luminous effects, but also greater planning of his paintings. Thus a number of his landscape drawings from this period appear to have served as compositional studies for paintings.[184] In a letter of 1886 to his dealer Paul Durand-Ruel, Pissarro explained that the Neo-impressionist art developed by Seurat was based on planning and preconception:

> As far as execution is concerned, we regard it as of little

> importance: art, as we see it, does not reside in the execution: originality depends only on the character of the drawing and the vision peculiar to each artist.[185]

Pissarro's decision to join the Neo-Impressionists was a brave departure. Although his work had not yet gained great commercial success, he was an established figure in Paris' advanced art world, and his defection from Impressionism to join the much younger Neo-Impressionists came at considerable personal costs in lost friendships with Monet and others, as well as warnings from Durand-Ruel that his abrupt change in style would slow the growth of demand for his work. These costs confirm the enthusiasm of Pissarro's rhetoric in attesting to the depth of his conviction that the conceptual approach of Neo-Impressionism represented a real advance over the unsystematic, experimental approach of Impressionism. In spite of the strength of his commitment, however, Pissarro soon found the conceptual approach of Neo-Impressionism unduly confining. In 1888 he wrote to Lucien of his frustration with Seurat's small touches of pure color: "How can one combine the purity and simplicity of the dot with the fullness, liberty, spontaneity and freshness of sensation postulated by an impressionist art?"[186] Similarly, the next year he complained to the critic Felix Fénéon of his problems with a "technique which ties me down and prevents me from producing with spontaneity of sensation."[187] In 1891, when he reported to Lucien his sadness at Seurat's premature death, Pissarro wrote that "I believe you are right, pointillism is finished."[188] Several years later, with his customary honesty Pissarro wrote to a friend and former fellow Neo-Impressionist to explain his decision to give up the method:

> I believe that it is my duty to write you frankly and tell you how I now regard the attempt I made to be a systematic divisionist, following our friend Seurat. Having tried this theory for four years

> and having now abandoned it, not without painful and obstinate struggles to regain what I had lost and not to lose what I had learned, I can no longer consider myself one of the neo-impressionists who abandon movement and life for a diametrically opposed aesthetic which, perhaps, is the right thing for the man with the right temperament but is not right for me, anxious as I am to avoid all narrow, so called scientific theories. Having found after many attempts (I speak for myself), having found that it was impossible to be true to my sensations and consequently to render life and movement, impossible to be faithful to the so random and so admirable effects of nature, impossible to give an individual character to my drawing, I had to give up. And none too soon![189]

Pissarro's account shows a clear awareness that an artist's ability to use a conceptual approach was not simply a matter of choice, but instead stemmed from basic traits of personality that he did not possess. Plagued as he was by self-doubt throughout his career, Pissarro must have envied the young Seurat, who dealt in "clear certainties," who "went his own way, sure of himself, trusting in the fertility and richness of his own esthetic sense," and who believed he could accomplish "the mission of releasing art from the tentative, the vague, the hesitant, and the imprecise."[190] In 1886, Pissarro must have hoped that he would acquire these attitudes if he adopted Seurat's artistic philosophy and practices. Within just a few years, however, he discovered that his lack of self-confidence was as immutable a feature of his personality as his need for spontaneity in painting. Thus true to his experimental nature, in 1889 he confided to Lucien that his only certainty in abandoning his attempt to follow Seurat was that he had to continue searching:

> I am at this moment looking for some substitute for the dot; so far I have not found what I want, the actual execution does not seem to me to be rapid enough and does not follow sensation with enough inevitability; but it would be best not to speak of this. The fact is I would be hard put to express my meaning clearly, although I am completely aware of what I lack.[191]

Pablo Picasso's artistic output was so vast that it is dangerous to generalize about his career without extended study, but it appears likely that as he grew older he tended to make fewer preparatory drawings for individual paintings, and that he also tended more often to produce paintings without any preparatory drawings.[192] It might be supposed that this implies that as he aged he evolved from a conceptual to a experimental approach. This is not necessarily the case, however, for particularly for an experienced artist, preparatory drawings may be unnecessary for preconception of a painting. A few accounts of Picasso's practices suggest this.

Francoise Gilot recalled that when she first went to live with Picasso in 1946 he tried to draw her, but was not satisfied with the results. He then asked her to pose for him in the nude. When she had undressed, Picasso had her stand with her arms at her sides:

> Pablo stood off, three or four yards from me, looking tense and remote. His eyes didn't leave me for a second. He didn't touch his drawing pad; he wasn't even holding a pencil. It seemed a very long time.
>
> Finally he said, "I see what I need to do. You can dress now. You won't have to pose again." When I went to get my clothes I saw that I had been standing there just over an hour.

The next day Picasso began, from memory, a series of works of Gilot in that pose, including a well-known portrait of her titled *La Femme-Fleur*.[193] Another account of Picasso's ability to preconceive a work without the use of sketches was given by his friend and dealer, Daniel-Henry Kahnweiler, to the photographer Brassaï in 1962. It involved Picasso's production of a linocut with multiple colors, in an unusual way. Instead of the normal procedure of cutting a separate linoleum plate for each color, Picasso used only one: after printing one color, he would recut the plate and print another color. Kahnweiler observed that by repeating this process Picasso

produced very complex prints, with as many as a dozen colors. Whereas the traditional approach permitted adjustments during the printing process, by allowing changes to any of the plates at the time of printing to make the separate images of the individual plates consistent with each other, Picasso's method provided no such margin for error, since the image for each color was irreversibly altered when the unique plate was recut to print the next color. Kahnweiler marveled at Picasso's ability to use this uncompromising process: "He must see in advance the effect of each color, because there's no pentimento possible! ... [I]t's a kind of clairvoyance. I would call it 'pictorial premonition.' I was at his home a few days ago and saw him working. When he attacks the lino, he makes out or sees in advance the final result."[194] Although this issue has not been systematically studied, these anecdotes about Picasso's practice suggest that it is possible that experienced conceptual painters, like chess masters, can preconceive their works without having to fix their preparatory images on paper.

The lack of systematic study of the careers of individual painters aimed at answering the question posed in this section makes it premature to offer any general conclusions as to whether it is possible for painters to change from one approach to the other. Yet as in the preceding section I can offer a conjecture, to be tested in future. This is that whereas it may be possible for conceptual artists to evolve gradually into experimental ones, it is not likely that experimental artists can change into conceptual ones. The logic of this conjecture is that accumulation of experience and knowledge over time may allow an early deductive way of thinking to develop into a more nuanced inductive one, but that it is much less likely that the uncertainty and complexity of an artist who initially follows an inductive approach can ever be changed successfully into the simplicity and certainty of the deductive thinker.

Anomalies

> The life of an artist is rightly a unit of study in any biographical series. But to make it the main unit of study in the history of art is like discussing the railroads of a country in terms of the experiences of a single traveler on several of them. To describe railroads accurately, we are obliged to disregard persons and states, for the railroads themselves are the elements of continuity, and not the travelers or the functionaries thereon.
>
> George Kubler, 1962[195]

Like other behavioral relationships in the social scientists, the predicted relationships between the categories of analysis used here and artists' life cycles are not laws, but tendencies. It is particularly important to remember this when using quantitative evidence to examine artists' careers, because of a significant departure of the analyses presented here from the normal practice of empirical economics. Economists often carry out econometric estimation of relationships involving the human life cycle, but they invariably do this with data that represent the experiences of large numbers of people. The resulting estimates summarize the average behavior of members of the relevant groups. The behavior of many of the people included in the data sets may differ sharply from that of the average, but the measurements of population averages can nonetheless remain powerful as long as these divergent cases are relatively uncommon. In the present case, however, the estimates of artists' life cycles given above are for *individual artists*. The visibility of any deviation from the typical relationship is obviously enormously magnified by this microscopic procedure, and consequently the possibility of unusual or anomalous cases should be kept in mind.

Yet although anomalies exist, some cases that initially appear anomalous can in fact be understood through relatively straightforward extensions of the analysis used above. These

extensions typically involve placing the case at issue within a broader context - either seeing the career of the artist in relation to those of others, or situating the innovation within the specific experiences of the artist. Several examples involving important modern artists provide illustrations.

As discussed earlier, Claude Monet was an experimental innovator. Monet believed that progress in art was possible only with total commitment to the study of nature and long hours of work. As late as 1890, at the age of 50, he wrote a friend that he was "profoundly disgusted with painting. It really is a continual torture! Don't expect to see anything new, the little I did manage to do has been destroyed, scraped off or torn up." Monet's goals were famously visual:

> [T]he further I get, the more I see that a lot of work has to be done in order to render what I'm looking for: "instantaneity," the "envelope" above all, the same light spread over everything, and more than ever I'm disgusted by easy things that come in one go.[196]

Although Monet was a great experimental artist, his major contribution was made at a very early age. The peak of his age-price profile occurs for work he did at age 29, and the five-year period from which the largest number of his paintings are illustrated in both the American and French textbooks is 1869-73, when he was 29-33.

These dates are hardly surprising, for they precisely locate the period when Monet was making his breakthrough innovations in Impressionism, which proved to be one of the most influential artistic achievements of the nineteenth century. During the summer of 1869, when Monet was 29, he painted with Renoir at a riverside café near Paris. Kenneth Clark called that café, La Grenouillère, the birthplace of Impressionism, as the two artists' novel treatment of the reflection of light on the waters of the Seine produced a new technique so powerful that it not

only directly affected sympathetic artists like Pissarro and Sisley, but induced a wide variety of artists whose interests were less obviously related, including Manet, Cézanne, Gauguin, and van Gogh, to experiment with Impressionist methods.[197] That this seminal experimental discovery was made by Monet before the age of 30 appears to be a powerful violation of the prediction that important experimental innovations require lengthy periods of development.[198]

The resolution of this apparent contradiction follows from the recognition that the development of innovations need not be made entirely by individual artists. Monet's early breakthrough appears to have resulted from his ability to take advantage of a research project that several older artists had begun. Art historians have long repeated Monet's account of how, early in his career, he had initially rejected the advice of the older artist Eugène Boudin to paint from nature, but how he had then learned valuable lessons from Boudin and his friend Johan Jongkind after he had understood their methods and goals. Thus in an interview in 1900, Monet recalled that "Boudin, with untiring kindness, undertook my education," teaching him to study nature, and that Jongkind later "completed the teachings that I had already received from Boudin." Monet never hid his debt to his informal teachers, acknowledging in the 1900 interview that after he met Jongkind in 1862, "from that time on he was my real master," while in 1920 he wrote to a friend that "I've said it before and can only repeat that I owe everything to Boudin." Monet explained that he came to be fascinated by Boudin's studies, "the products of what I call instantaneity."[199] But after learning the results of the research of the two older landscape painters, Monet formulated goals more ambitious than theirs, and it was only after several years of further experimentation that he discovered "the principle of the subdivision of colors" that allowed him to achieve the novel "effects of light and color" that transformed Paris'

advanced art world.[200]

Monet's career illustrates George Kubler's warning that "biographies ... are only way stations where it is easy to overlook the continuous nature of artistic traditions."[201] The innovation of Impressionism provides an example of a substantial difference between the overall duration of a research project and the work on that project by a key member. Monet's leadership in the discoveries of Impressionism appears to have been a consequence of his ability to build on the extended studies of the older artists: his relationship with Boudin and Jongkind was equivalent to joining a research project already in progress, and allowed him to formulate the goals and develop the techniques of Impressionism much sooner, and at a much younger age, than if he had had to work without the benefit of their lessons.

It is interesting to note that the pattern of Monet's career reflects his experimental approach in spite of his early great achievement. Unlike many conceptual innovators who made important early discoveries and simply declined thereafter, Monet made several significant contributions later in his life. Table 8 presents the distributions by age of the illustrations of Monet's paintings in the collections of American and French textbooks described earlier. Although both groups of scholars give clear precedence to the work of Monet's late 20s and 30s, both distributions also include large numbers of illustrations from Monet's 50s and for the work he did after the age of 60. The paintings presented from Monet's 50s are from the series he executed during the 1890s, including the grain stacks, the poplars, and the views of Rouen Cathedral, while the illustrations of works he produced after 60 give primary emphasis to the many paintings of water lilies he made at Giverny. Both of these later bodies of work made innovations independent of the earlier discoveries in Impressionism. Thus during the 20th

century many artists would adopt the practice of painting in series. This would often stem from a belief about the value of seriality that Monet articulated in 1891, when he said of the grain stacks that the individual canvases would "only acquire their value by the comparison and succession of the entire series."[202] And during the 1950s, a number of critics and artists pointed to Monet's late paintings of water lilies as a forerunner of Abstract Expressionism, in their size, composition, and use of color.[203] Because of his experimental approach, however, Monet did not arrive at these later innovations suddenly, but as John House observed, "this transformation ... was the result of a protracted process of evolution."[204]

Vincent van Gogh's career appears to present an anomaly of an opposite type. Van Gogh was a conceptual innovator, hailed in 1890 by the critic Albert Aurice as a great Symbolist painter who "considers this enchanting pigment only as a kind of marvelous language destined to express the Idea."[205] Yet van Gogh produced his most valuable work not in his 20s, but at the age of 36. Although van Gogh became a painter relatively late, after failing as an art dealer and pastor, his greatest achievements were nonetheless made in the final few years of his life, when he had been a full-time artist for nearly a decade. Yet van Gogh's career illustrates the necessity of a knowledge of advanced art in allowing an artist to make new contributions.

Van Gogh was largely a self-taught artist. He spent the first five years of his career as a painter in his native Holland and Belgium, where he could not see the most recent developments in modern art. Before he went to Paris, his brother Theo had told him of Impressionism, but Vincent didn't know what it was. When Vincent decided to join his brother in Paris in 1886, he quickly realized that, as he wrote to a fellow artist who had remained in Antwerp, "There is but one Paris ... What is to be gained is *progress* and what the deuce that is, it is to be found here."[206]

In Paris, under the guidance of Camille Pissarro, with astonishing speed van Gogh gained a knowledge of the methods and goals not only of Impressionism but also of Neo-Impressionism, and he became acquainted with Paul Gauguin, Emile Bernard, and a number of other young artists who were developing a new Symbolist art. Exhausted by two years of intense work in Paris, in 1888 van Gogh left for Arles. It was there that he developed the personal form of Symbolist painting that became his distinctive contribution to advanced art. Van Gogh recognized that the Impressionists would find fault with his new style, "because instead of trying to reproduce exactly what I have before my eyes, I use color more arbitrarily, in order to express myself forcibly." His exaggerations of color and form allowed him to communicate the intensity of his ideas and emotions, which he couldn't do within the constraints of Impressionism: "If you make the color exact or the drawing exact, it won't give you sensations like that."[207]

Clement Greenberg emphasized that "the ambitious artist ... has to assimilate the best new art of the moment, or the moments, just before his own."[208] Vincent van Gogh did not begin to assimilate the best new art of his time until 1886, when he arrived in Paris. It was only then that he learned the techniques and motivations of the art that he would have to build on, and depart from, in order to make a significant contribution to advanced art. He did this remarkably quickly, as the landmark works of his career began to appear in 1888, just two years after he began his real education as an advanced artist, and continued from then through the remaining two years of his life. The art of these final years became a central influence on Fauvism and Expressionism. That van Gogh could make such a great contribution in such a short period is a clear consequence of his conceptual approach to art.

Roy Lichtenstein's career provides another example of the effect of a conceptual artist's

delayed exposure to advanced art. Tables 5 and 7 show that Lichtenstein was the oldest of the leading conceptual artists of his era when he made his greatest contribution. Early in his career, Lichtenstein lived in the Midwest and upstate New York. In 1960 he took a teaching job at Rutgers University, where his colleagues included Allan Kaprow and Claes Oldenberg, who were experimenting with Happenings, and using a variety of objects as props in their performances and sculptures. Although Lichtenstein told an interviewer that at the time he hadn't been aware of being influenced by his colleagues, he later realized that "Of course, I was influenced by it all."[209] His art began to change almost immediately, as during 1961 he first inserted cartoon characters into his paintings, and soon thereafter began to make entire paintings that copied comic strips. In 1963 he arrived at the technique that he would generally use thereafter, as he began by making a small drawing that he then projected onto a larger canvas to allow him to trace the outlines for the images in his paintings.[210] Lichtenstein made most of his best-known works in 1963, including *Whaam!*, which is the single painting by any American artist of his generation that is most often reproduced in textbooks.[211] Thus although Lichtenstein did not produce his breakthrough work until he was 40 years old, he arrived at the images that embodied his major conceptual innovation less than three years after his first exposure to New York's advanced art world.

The social sciences do not produce deterministic laws from which there are no deviations, so inevitably there will be experimental artists who make major contributions early in their careers, and conceptual artists who make major contributions late in theirs. Yet what the examples considered here suggest is that we should not immediately assume that these occurrences are anomalous. Monet's life cycle appears as an anomaly only if we consider his

career in isolation. When we place it in context, it serves as a reminder that artistic innovations are not made by isolated geniuses, but are usually based on the lessons of teachers and the collaboration of colleagues. Unlike many other instances in which young artists have reacted against the art of their teachers, Monet embraced the goals and methods of Boudin and Jongkind, and used their work as a point of departure for the development of even more radical techniques and intentions. The careers of van Gogh and Lichtenstein demonstrate that innovative artists must understand the advanced art of their time before they can make new contributions. What appears to be necessary for radical conceptual innovation is not youth, but an absence of acquired habits of thought that inhibit sudden departures from existing conventions. When van Gogh learned the methods and goals of Impressionism, he could see almost immediately that it was not an art that was suited to his temperament, but his own subsequent discoveries were then aided by his relationships with other young artists who were also reacting against Impressionism out of similar motives. Even less consciously, Lichtenstein responded just as quickly to the conceptual innovations that were changing advanced American art in the early 1960s.

Masters and Masterpieces

> In order to be noticed at the exhibition, one has to paint rather large pictures that demand very conscientious preparatory studies and thus occasion a good deal of expense; otherwise one has to spend ten years until people notice you, which is rather discouraging.
>
> Frédéric Bazille, 1866[212]

This analysis of artists' life cycles has implications for a number of significant issues in the history of modern art. Some of these have long been of interest to art historians, but others have actually not been noticed by historians. One of the latter is posed by Tables 9 and 10. These list the individual paintings, by artists who lived and worked in France during the late 19th

and early 20th centuries, that are most often reproduced in the American and French textbooks surveyed earlier in this paper. Both lists rank the top ten paintings by number of illustrations; because of ties, this yields a total of 11 paintings in Table 9, and 12 in Table 10.

The paintings in Tables 9 and 10 are all classic works of modern art, their images immediately familiar to students of modern art. Their importance is the subject of little disagreement among scholars of different nations; eight paintings appear in both tables, and no painting ranked among the top five works in either table fails to appear in the other table. It might therefore be concluded that these lists hold no surprises.

Yet Tables 9 and 10 do hold a major surprise. Some of the very greatest painters of this era, including Cézanne, Degas, Pissarro, and Renoir, fail to appear on either list. At the same time, a number of artists, including not only Picasso and Manet, but also Courbet and Duchamp, have multiple entries on the lists. The puzzle is considerable: why does Cézanne, one of the very most important painters of the modern era, have no painting among those works identified by a consensus of art scholars as the most important, while Courbet and Duchamp, who are not generally considered nearly as important, both have several paintings that are ranked among the most important individual works by both American and French scholars?

A hint as to the resolution of this puzzle is suggested by an examination of Tables 9 and 10 in light of the two categories of artist defined by this study. The two tables include a total of 15 paintings. Of these, all but one were executed by conceptual artists. Monet's *Impression, Sunrise*, which ranks seventh in Table 10, is the only painting in either table produced by an experimental artist. The other 14 paintings, which fill 22 of the 23 places in the two tables, were all made by conceptual painters.

The puzzle is resolved by combining this recognition of the conceptual origin of nearly all of these modern masterpieces with an understanding of the institutions of the art market in France during this period. Throughout the first three quarters of the 19th century, French artists understood that the government's official Salon was the sole means of having their work presented to the public in a setting that would assure critics and collectors of its worth: the Salon had an effective monopoly of the legitimate presentation of new art to the public. The enormous size of these annual or biennial exhibitions, which typically had thousands of entries, produced a considerable danger that even if an artist succeeded in having his work selected by the Salon's jury, it would be ignored because it was hung in a bad location. Historian George Heard Hamilton observed that "one way for an artist to avoid such a calamity was to paint a picture so large it could not possibly be overlooked. Such huge 'machines,' by reason of their size along, attracted critical and popular attention quite out of proportion to their merit."[213]

Conceptual painters had a decisive advantage in producing large and complex works that, in Bazille's words, "demand very conscientious preparatory studies." Six of the paintings in Tables 9 and 10 - three each by Courbet and Manet - were initially submitted to the official Salon. Producing these large works was a regular part of these artists' annual routines. So for example late in 1854, Courbet wrote to a friend that "I have managed to sketch my painting, and at the moment it is entirely transferred to the canvas, which is twenty feet wide and twelve feet high. This will be the most surprising painting imaginable: there are thirty life-size figures." He noted that "I have two and a half months to carry it out ... so that all told I have two days for each figure."[214] This schedule was dictated by the deadline for submitting works to the Salon of 1855, and Courbet met it. His confidence that he would be able to do this resulted from his knowledge

that once he had made a full compositional drawing of a painting, the execution of the work would follow without unforeseen difficulties: "Works of art are conceived all at once, and the composition, once it is well established and firmly outlined in the mind in all its details, casts it into its frame on paper or on canvas in such a way that there is no need to modify it in the course of execution."[215]

The importance of the official Salon declined considerably during the final quarter of the 19th century, but the importance of great individual works nonetheless persisted. In large part, this was because for the remainder of the century other large-scale group exhibitions continued to be the necessary venues for the legitimate presentation of new art to the public. Thus many painters, including Matisse and Seurat, persisted in the practice of regularly planning large, ambitious paintings for display in group exhibitions. But even after exhibiting at group shows ceased to be necessary, the *machine* continued to be the chief token of success in Paris' advanced art world. Although Picasso was the first major modern artist who established himself without participating in group exhibitions, his greatest single work was nonetheless prompted by the tradition of the Salon *machine*. Early in his Paris career, the ambitious young Picasso recognized Matisse as his rival for the informal leadership of the advanced art world, and he envied the attention Matisse gained from showing his *Joy of Life* (listed in Table 9) at the 1906 Salon des Indépendants. Challenged by Matisse's painting's "success within the terms of traditional Salon canvases," Picasso methodically and deliberately set out to produce a "large salon-type painting" that would be recognized as a masterpiece by the artists, critics, and collectors who made up Paris' advanced art world.[216] He succeeded in producing the painting that many art historians consider the most important painting of the 20th century, as the

Demoiselles d'Avignon dominates both Tables 9 and 10.

The importance of group exhibitions in the French art world of the 19th century thus profoundly influenced artists' practices. Ambitious painters devoted disproportionate effort to making important individual paintings as a means of establishing and advancing their reputations. And this type of competition afforded a great advantage to conceptual artists, whose practices better enabled them to plan and carry out large and complex individual paintings. Ambitious experimental painters struggled under the burden of trying to do this. Recognizing this leads to another important implication of the present analysis for our understanding of the history of modern art.

The Impressionists' Challenge to the Salon

> I shan't sent anything more to the jury. It is far too ridiculous...to be exposed to these administrative whims ... What I say here, a dozen young people of talent think along with me. We have therefore decided to rent each year a large studio where we'll exhibit as many of our works as we wish.
>
> Frédéric Bazille, 1867[217]

The Impressionists' decision to secede from the official Salon and hold their own independent group exhibitions is among the most celebrated episodes in the history of modern art. Yet in spite of the vast amount of scholarly attention that has been devoted to describing these exhibitions and their consequences, one basic question that has been surprisingly neglected is why it was Monet and a few of his friends, rather than any others among the vast number of other neglected painters in mid-nineteenth century Paris, who actually undertook to devise an institutional alternative to the Salon. Understanding the differing working methods of conceptual and experimental artists provides a key element of the answer to this question.

A major motivation for the Impressionists' desire to hold their own exhibitions appears to have been their recognition that, as experimental painters, their procedures were not well suited to fighting for acceptance on the Salon's terms. Bazille and Monet first formulated the idea of holding independent group exhibitions in 1867. For Monet, this came at a point when he had failed at two time-consuming attempts to produce major individual paintings for the Salon. During 1865 and early 1866, he had spent months working on a large painting, 15 by 20 feet, that would be his *Déjeuner sur l'herbe*. He made a number of figure drawings for the painting, a large charcoal sketch of the composition, and an oil sketch of the whole composition before beginning the final canvas. Unable to complete the painting on time, Monet missed the submission deadline for the 1866 Salon. He ultimately abandoned the enormous unfinished work, which he later described as "incomplete and mutilated."[218] In 1866, he set out to make a smaller but still ambitious painting, eight by seven feet in size, of *Women in the Garden*. This painting, made without preparatory sketches or studies, was rejected by the Salon jury in 1867.[219] These two unsatisfactory attempts appear to have convinced Monet that it was a mistake for him to try to follow his friends Courbet and Manet in producing large individual paintings for the Salon. Bazille's account of the two friends' original plans for a group exhibition in 1867 described a show "where we'll exhibit as many of our works as we wish," a format more appropriate for an experimental approach that naturally produced groups of smaller paintings rather than impressive individual works.

Manet's persistent refusal to stop exhibiting at the official Salon and join his friends at their independent shows is similarly illuminated by the fact that unlike Monet, Degas, Pissarro, and Sisley, Manet was a conceptual artist. Despite a number of snubs by the Salon's jury,

including the rejection of his *Déjeuner sur l'herbe* in 1863, Manet held to the position that "the Salon is the true field of battle - it is there that one must measure oneself."[220] Although his style often created conflict with the Salon's jury, Manet's conceptual approach allowed him regularly to create the large and complex individual paintings that were well suited to compete for attention at the great official exhibitions. In contrast, Monet and his Impressionist friends appear to have realized that they could create large paintings for the Salon only by sacrificing quality in their art.

Table 11 demonstrates the extent to which the Impressionists adapted their independent exhibitions to their experimental approach, listing the number of paintings by the leading members of the group included in each of the eight shows. Monet exhibited nine paintings at the first show and at least twice that number in each of the four later shows in which he participated. Five artists - Degas, Monet, Pissarro, Renoir, and Sisley - each displayed 20 or more works in at least one of the exhibitions, and three of them did so more than once. These large numbers of paintings, which were much greater than they could ever have hoped to enter in the official Salon, could almost serve effectively to give the leaders of the movement one-man shows in the midst of their group exhibitions. In light of the analysis of this paper, the Impressionists' group exhibitions can thus be seen as the response of a group of ambitious young experimental painters to an official institution that they recognized to be better suited in format to conceptual artists.

Contrasting Careers

> The young master is a new phenomenon in American art.
> Harold Rosenberg, 1970[221]

The dramatic innovations that many conceptual artists have made early in their careers

have often allowed them to gain attention at much younger ages than their experimental counterparts. There were instances of this in the 19th century, as Manet became the focal point for controversy in Paris' advanced art world at the age of just 31 when his *Déjeuner sur l'herbe* was shown at the Salon des Refusés in 1863, and Georges Seurat similarly gained widespread attention at the age of 27, when his *Sunday Afternoon on the Island of the Grande Jatte* was exhibited in the final Impressionist exhibition in 1886. But this would become much more common in the next century, as critics, dealers, and collectors became more aware of the fact that the paintings that introduced radical innovations often rose sharply in value within as little as a decade after their appearance.

One consequence of this recognition was that many art dealers became more willing to give exhibitions to young and unproven painters. This can be seen in a shift that occurred in New York during the late 1950s and early '60s, as the experimental Abstract Expressionists gave way to the conceptual artists of the next generation. Table 12 shows that the median age at which 11 leading Abstract Expressionist had their first one-man shows in New York was 34, but that this age fell to just 27.5 for a dozen leading members of the next generation. Only two of the 11 Abstract Expressionists had their first shows before the age of 30, compared to 10 of the 12 artists of the following cohort. Three major Abstract Expressionists - de Kooning, Still, and Newman - did not debut until after 40, whereas all the leaders of the next generation had their first shows well before they reached 40.

When Frank Stella was given a retrospective exhibition at the Museum of Modern Art in 1970 at the age of just 33, the critic Harold Rosenberg, who was a prominent supporter of the Abstract Expressionists, was indignant. He observed acidly that "The indispensable qualification

of the creators of American art has been longevity." Nor was this unique to American art, for Rosenberg declared that "It is inconceivable that Cézanne, Matisse, or Miró could have qualified for a retrospective in a leading museum after their first dozen years of painting; certainly Gorky, Hofmann, Pollock, and de Kooning did not." Rosenberg argued that major artistic contributions required long gestation periods: "Self-discovery has been the life principle of avant-garde art ... and no project can, of course, be more time-consuming than self-discovery. Every step is bound to be tentative; indeed, it is hard to see how self-discovery can take less than the individual's entire lifetime." In closing his scathing review of Stella's exhibition, Rosenberg protested that "For a coherent body of significant paintings to spring directly out of an artist's early thoughts, a new intellectual order had to be instituted in American art."[222] Although Rosenberg deplored this situation, his analysis of it was correct. As the experimental methods of the Abstract Expressionist were replaced by a variety of conceptual approaches, the artistic value of experience declined sharply, and the new intellectual order gave rise to a new career pattern in which artists would routinely gain fame, and often fortune, at an early age.[223]

Conflicts

> We worked for years to get rid of all that.
>
> Mark Rothko, on Jasper Johns' first one-man show, 1958[224]

> I'm neither a teacher nor an author of manifestos. I don't think along the same lines as the Abstract Expressionists, who took those sorts of things all too seriously.
>
> Jasper Johns, 1969[225]

The difference in the timing of the careers of experimental and conceptual artists has been capable of causing considerable resentment, as experimental artists who have spent years

struggling, often in poverty and obscurity, to make contributions to art have been jealous of younger conceptual artists' quick commercial success. Yet conflicts between the two types of artist have often arisen from a deeper source than mere jealousy. For although it need not always be manifest, there is a powerful potential for hostility and distrust between artists of the two groups as a result of differences in their philosophies of art, and consequent differences in their practices and products.

There is a strong tendency for conceptual artists to regard experimental painters as mere artisans, lacking in intelligence. The conceptual innovator Marcel Duchamp complained that modern art had been addressed not to the mind, but to the eye: "I was interested in ideas - not merely in visual products. I wanted to put painting once again at the service of the mind."[226] Duchamp explained that his art was a reaction against what he considered an excessive emphasis on appearance: "In French there is an old expression, *la patte*, meaning the artist's touch, his personal style, his 'paw.' I wanted to get away from *la patte* and all that retinal painting." The one modern artist he exempted from his criticism was his fellow conceptual artist Seurat: "He didn't let his hand interfere with his mind."[227] Duchamp had little regard, however, for those he considered retinal painters: "'Bête comme un peintre' was the saying in France all through the last half of the nineteenth century, and it was true, too. The kind of painter who just puts down what he sees *is* stupid."[228] Duchamp's disdain for "*la patte* and all that retinal painting" was echoed by a number of conceptual artists during the 1960s. So for example Frank Stella explained that "I do think that a good pictorial idea is worth more than a lot of manual dexterity."[229]

Conversely, experimental painters often consider conceptual artists to be intellectual

tricksters, lacking in artistic ability and integrity. So for example in 1887 when his former protégé Paul Gauguin began to gain recognition for his conceptual contributions to Symbolism, Camille Pissarro could only conclude that Gauguin was not seriously committed to art: "at bottom his character is anti-artistic, he is a maker of odds and ends." With bitter irony, Pissarro wrote to his son that Gauguin had gained "a group of young disciples, who hung on the words of the master... At any rate it must be admitted that he has finally acquired great influence. This comes of course from years of hard and meritorious work - as a sectarian!" Several years later, when a journalist praised Gauguin for his innovations, Pissarro again complained of the younger artist's insincerity: "When one does not lack talent and is young into the bargain how wrong it is to give oneself over to impostures! How empty of conviction are this representation, this décor, this painting!" In what may have been the last meeting between the two former friends, Pissarro attended an exhibition of Gauguin's paintings at Durand-Ruel's gallery on the occasion of the younger artist's return from his first stay in Tahiti in 1893. Pissarro again found the work to be dishonest, and told his former pupil as much:

> I saw Gauguin; he told me his theories about art and assured me that the young would find salvation by replenishing themselves at remote and savage sources. I told him that this art did not belong to him, that he was a civilized man and hence it was his function to show us harmonious things. We parted, each unconvinced. Gauguin is certainly not without talent, but how difficult it is for him to find his own way! He is always poaching on someone's ground; now he is pillaging the savages of Oceania.

Pissarro noted that his friends agreed: "Monet and Renoir find all this simply bad."[230] Gauguin's remarks to Pissarro at the gallery were prophetic, for his work would in fact influence many of the leading painters of the next generation, including Picasso and Matisse. Yet although these

later conceptual artists could find inspiration in Gauguin's Symbolism and his imaginative use of primitive art, Pissarro and his Impressionist friends, whose lives were devoted to the painstaking experimental development of a visual art, could see in his work only insincerity, opportunism, and plagiarism.[231]

The Impressionists' reaction to their conceptual successors was later echoed by the Abstract Expressionists' rejection of the conceptual artists who followed them in New York. Thus when Robert Motherwell first saw Frank Stella's early paintings of black stripes, he remarked "It's very interesting, but it's not painting."[232] And in 1962, Motherwell explained that the new art was not in the true line of descent of fine art:

> Immediately contemporary painting seems to be developing in the direction of pop art. Coca-Cola! There will be a tremendous excitement about what, in effect, will be the "folk art" of industrial civilization and thus different from preceding art: i.e., the reference will not be to high art, but to certain effects of industrial society. The pop artists couldn't care less about Picasso or Rembrandt.

With obvious irony, Motherwell added that "I am all in favor of pop art ... I'm glad to see young painters enjoying themselves."[233]

Admirers of conceptual art typically praise its brilliance, clarity, and structure; detractors often criticize it as cold, calculated, and superficial. Experimental artists are often praised for their touch, and for the wisdom that comes with experience; they are often criticized for their lack of discipline, and for their mysticism.

During the era of modern art, experimental painters have been recognized as leaders during relatively brief periods, while conceptual artists have dominated for longer intervals. Thus the experimental art of Impressionism was the central form of advanced modern art for

little more than a decade, then was quickly succeeded by a variety of conceptual approaches including Neo-Impressionism and Symbolism, which were in turn followed by the conceptual approaches of Fauvism and Cubism. Most of the major movements that followed Cubism were conceptual, though Surrealism included both conceptual and experimental painters among its diverse and numerous followers. Some of the latter were an early influence on Abstract Expressionism, which became the dominant movement in the advanced painting of the 1950s. Yet this experimental art was quickly displaced by a variety of conceptual approaches in the late '50s and beyond, as Pop, Minimalism, and a number of other innovations captured the attention of the art world. Although it does not appear that there is any necessary pattern or cycle in this alternation between approaches, several factors do appear to exert systematic influences. One is that the perceived excesses of either approach can create an interest in reacting against it, not only on the part of young artists, but also among critics, dealers, and others in the art world who can encourage and help these young artists. Thus for example a common theme in the recollections of many of the conceptual innovators of the 1960s is that when they were beginning their careers they found the art and attitudes of the Abstract Expressionists oppressive. These younger artists used humor and irony to combat what they considered the pretentious emotional and philosophical claims of the Abstract Expressionists, and they substituted impersonal execution for what they perceived to be the excessively personal styles of their predecessors.

Reactions against a dominant approach can of course occur in either direction, as experimental artists can equally seek to overthrow dominant conceptual paradigms. Today's art world, with its frequent complaints against the current excesses of conceptual art, may be ripe for

an experimental revolution. Yet considering this possibility points to a different influence that may be a key factor in understanding why the predominantly conceptual phases of the modern era have been longer than the experimental ones. This is simply that because radical conceptual innovations can be made much more quickly than experimental ones, conceptual artists will tend to have an advantage in any situation in which there is a strong demand for innovation. Arthur Danto recently observed that "In many ways, the Paris art world of the 1880s was like the New York art world of the 1980s - competitive, aggressive, swept by the demand that artists come up with something new or perish."[234] The artists who thrive in these situations tend to be the young geniuses who can innovate deliberately and systematically, before giving way to the next cohort of young geniuses; thus Seurat emerged as a leader in Paris' advanced art world in the 1880s, just as young conceptual artists like Julian Schnabel and Jean-Michel Basquiat emerged in the New York art world of the 1980s. In contrast, experimental painters were largely eclipsed in both these eras, perhaps overwhelmed by the urgent demand quickly to produce dramatic new results. So for example one of the greatest experimental painters of the 19th century largely retreated from Paris during the contentious 1880s, as after 1882 Cézanne lived in relative seclusion in Provence, seeking not only the inspiration of the southern landscape he loved, but also the peace and solitude he felt he needed for the slow and painstaking development of his art. His letters refer to his mistrust of the conceptual debates that were raging in Paris' cafes, as when he explained in 1889 that "I had resolved to work in silence until the day when I should feel myself able to defend theoretically the result of my attempts."[235] We may not yet know the identity of today's important experimental artists if they are similarly developing their art out of the limelight, away from the hectic central battlegrounds of the art world where artists feel that

"There is this pressure now to be surer, quicker, more confident."[236]

When the early conceptual innovations of a young artist are recognized quickly, the reassurance - and income - they provide the artist can be of great value, in affording him the freedom to experiment further. It was in recognition of this that Picasso described the success of his early blue and rose periods as "screens that shielded me ... It was from within the shelter of my success that I could do what I liked, anything I liked."[237] His subsequent radical departure into Cubism may have been a product of this shelter. Yet the greatest danger to conceptual artists may be the dry spells that occur when they run out of ideas.[238] Although many experimental painters suffer from chronic uncertainty about the quality of their work, they appear to be less likely to stop working altogether in crises of confidence, for their trial-and-error approach usually presents many possible avenues for further research. And experimental artists can draw some comfort from the realization that their work is more likely to improve over time than that of their aging conceptual counterparts.

The Globalization of Modern Art

> It was for me the greatest revelation. I understood instantly the mechanics of the new painting.
>
> Raoul Dufy, on seeing Matisse's *Luxe, calme, et volupté*, 1905[239]

Just as conceptual innovations can often be created immediately, as the expression of new ideas, so can they often be communicated immediately. Experimental art, with more complex methods and goals, usually requires direct contact between teacher and student for instruction that leads to real understanding and mastery, but conceptual art, with its less complex methods and goals, can often be transmitted without direct contact between artists, merely

through seeing reproductions of works of art, or even reading written texts.

This difference in the ease and speed of transmission of the two types of art has had important implications for the changing geographic locus of the production of advanced art during the modern era. Artists who wanted to learn the techniques and philosophy of Impressionism had to spend time talking and working with members of the core group. Pissarro was the most welcoming of them, and Cézanne and Gauguin both spent time working in Pontoise under his guidance in the late 1870s and early '80s. In addition, Pissarro appears to have spent time explaining Impressionism to van Gogh in Paris during 1886-87, and to Matisse in the late 1890s.[240] Mary Cassatt similarly served an informal apprenticeship with Degas.[241] In all these cases, the instruction occurred gradually, for studying Impressionism involved learning a variety of techniques, as well as understanding a diffuse set of visual goals that were more easily demonstrated than expressed verbally.

Even in the late 19th century, the communication of conceptual innovations apparently began to be made more quickly, with considerably less contact. A celebrated instance occurred late in the summer of 1888 in the artists' colony of Pont-Aven, when the 25-year-old art student Paul Sérusier introduced himself to Gauguin and spent a single morning painting under the master's supervision. Gauguin told Sérusier not to hesitate to use pure colors to express the intensity of his feelings about the landscape of a small wood. Upon Sérusier's return to Paris, the small painting he had made under Gauguin's supervision electrified a group of his fellow students, including Maurice Denis, Edouard Vuillard and Pierre Bonnard. The students named the painting *The Talisman*, gave themselves the collective name of the Nabis, from the Hebrew word for prophets, and began to meet regularly to discuss Gauguin's Symbolist ideas as

transmitted by Sérusier. Thus the instruction of just a few hours, embodied largely in a single small painting that "seemed crude because of its synthetic formulation," gave rise to one of the leading conceptual movements of the 1890s. This was of course possible because Gauguin's message was not visual, but conceptual. As Denis later wrote in a eulogy for Gauguin, Sérusier's experience provided the group of young painters with a liberating new idea, for it

> introduced to us for the first time, in a paradoxical and unforgettable form, the fertile concept of the "plane surface covered with colors assembled in a certain order." Thus we learned that every work of art was a transposition, a caricature, the passionate equivalent of a sensation received.[242]

The first major artistic movements of the 20th century also originated in Paris, as Fauvism and Cubism were both products of collaborations among young painters in the city. Most of the movements that built on Fauvism and Cubism also took their mature form only after their leading members had seen that work at first hand in Paris, and encountered some of the artists who had worked in those earlier movements. Thus before the outbreak of World War I not only the most important French painters of the next generation, but also such major figures from elsewhere in Europe as Wasily Kandinsky, Franz Marc, Umberto Boccioni, Gino Severini, and Piet Mondrian were among the scores of young artists who spent time in Paris working and studying the accomplishments of Picasso, Matisse, and their collaborators.

A major departure from this pattern occurred, however, as Kazimir Malevich made a radical breakthrough to abstract painting in Moscow in 1915 without ever having visited Paris. Malevich's Suprematism was based on Cubism as well as other Western European conceptual advances, but Malevich was able to learn about these without leaving Moscow. Malevich had moved to Moscow from his native Ukraine in 1907. There he met a group of talented young

artists, including Mikhail Larionov and Natalia Goncharova, with whom he worked and exhibited. In Moscow, Malevich saw the results of recent developments in advanced art in several settings. In 1908 a major public group exhibition organized by Russian artists included a survey of French art from Cézanne to Picasso. For a number of years Malevich was able to see the most recent work of Matisse, Picasso, Braque, and others in the private collection of Sergei Shchukin, a wealthy Russian merchant who was one of the first major collectors of the young French artists. Malevich followed the development of Léger's work through photographs carried to Moscow by a Russian painter, Alexandra Exter, a pupil of Léger's who divided her time between France and Russia. He learned of Italian Futurism by reading the manifestos and pamphlets published by Boccioni and his colleagues. As John Golding observed in considering the impact of these published articles on Malevich and other young artists, these manifestos

> were almost invariably blueprints for art that was about to be produced, ... and this explains why the influence of Italian Futurism was to be ... entirely disproportionate to that of its artistic and intellectual achievements: it provided artists all over the world with instant aesthetic do-it-yourself kits.[243]

Malevich's paintings from the years leading up to his 1915 departure into abstraction reveal the direct influence of the most recent innovations of many advanced French and Italian conceptual painters, including Matisse, Picasso, Braque, Léger, Duchamp, and the Futurists, in spite of the fact that he had never worked with, or even met, any of these artists. Even Malevich's conceptual leap of 1915, in which he launched the Suprematist movement with an exhibition that included his painting *Black Square*, demonstrated his understanding of the process of conceptual innovation, as it had developed in Western Europe. Thus not only did the flat geometric shapes of his abstract paintings reflect his analysis of the Synthetic Cubist collages

of Picasso and Braque, but the paintings were accompanied by a *Suprematist Manifesto* that presented an ambitious intellectual rationale for the art works, reflecting lessons Malevich had learned from the Futurists about the value of theoretical declarations for new conceptual art movements.[244]

Later in the 20th century major geographic shifts occurred in the production of advanced art. The transmission of experimental art, however, continued to require direct extended contact between the artists, or groups of artists, involved. The development of Abstract Expressionism benefitted decisively from the presence in New York of a number of European artists who came to the United States to escape Fascism. Hans Hofmann, who founded an art school in New York in 1933, had lived in Paris and Munich, and brought with him a deep understanding not only of the art of the School of Paris but also of German Expressionism, which he communicated through his lectures as well as his paintings. The young Chilean Surrealist painter Roberta Matta came to New York from Paris, and introduced Robert Motherwell, William Baziotes, and Jackson Pollock to the theory of automatism.[245] Some of the Abstract Expressionists served informal apprenticeships with American painters. Milton Avery attracted a group of young followers, including Adolph Gottlieb, Barnett Newman, and Mark Rothko, who met in weekly sketching classes in Avery's apartment. Avery's simplified forms, flat areas of expressive color, and quiet atmospheric effects influenced these younger painters, and even Rothko's use of thinned paint in his later work may have resulted from his early studies with Avery. Rothko stressed the importance of this direct contact for his education as an artist in his eulogy for Avery in 1965: "The instruction, the example, the nearness in the flesh of this marvelous man - all this was a significant fact - one which I shall never forget." [246] Whoever their teachers, and whatever

the form their lessons took, the Abstract Expressionists' educations were heavily based on long sessions spent working together in studios, and arguing in cafeterias and bars, for their achievements were based on gradual development rather than sudden breakthroughs.

The same would not necessarily be true for the conceptual innovators of the next generation, whose achievements arrived quickly and early. Frank Stella first saw Jasper Johns' paintings, at Johns' first one-man show, at Leo Castelli's gallery in 1958. Stella later recalled his reactions to Johns' targets and flags: "The thing that struck me most was the way he stuck to the motif... the idea of stripes - the rhythm and interval - the idea of repetition. I began to think a lot about repetition." Stella was then a senior in college. He did not meet Johns, and his teachers at Princeton were hardly sympathetic to his new interest in Johns' art. (One of them, the artist Stephen Greene, was so amused by one of Stella's paintings that resembled a flag that he wrote "God Bless America" across the canvas.[247]) Yet Stella persisted, and just a year later, during 1959, he painted most of the Black Series, which remains the most often reproduced body of work of his celebrated career.[248] In 1960, Stella exhibited these paintings at his own first one-man show, also at Leo Castelli's gallery.

Soon significant instances of borrowing conceptual innovations would occur that did not involve even direct sight of the original art. As a student in Dusseldorf in the early 1960s, Sigmar Polke saw reproductions of early examples of American Pop art. Polke quickly adapted to his own purposes Warhol's use of enlarged newspaper photographs and Lichenstein's painted imitations of printed Ben Day dots. When Polke showed the resulting paintings in Dusseldorf in 1963, in an exhibition that he and two fellow students presented in the condemned premises of a vacant furniture store, his German version of Pop art quickly established him, at the age of 22, as

a leader of his generation of German artists.[249] Polke and his friends had no desire to hide the foreign source of their techniques, as they proudly declared their relationship to the Anglo-American Pop movement, stating in a press release that theirs was "the first exhibition of 'German Pop Art'."[250]

Rapid borrowing and utilization of new artistic devices, across ever wider geographic areas, has become increasingly common in recent decades, in which conceptual approaches to art have predominated. One indication of this progressive globalization of modern art is that art historians are finding that they are no longer able to divide their subject as neatly along geographic lines as in the past. There are many published histories of French, or European, modern art from the mid-19th century to World War I or to the mid-20th century, and there are many histories of American art from World War II to the 1960s. For more recent periods, however, art historians are finding these geographic restrictions to be more problematic in producing their narratives, not only because it is less clear that there is a single dominant locus of the advanced art of the past half century, but also because artistic influence has spread more rapidly and freely over a wider area in recent times.[251]

Conceptual innovations can often be borrowed more readily than experimental ones because they are typically less complex, and because they are less tied to specific artistic goals. Thus during recent decades many artists have used earlier conceptual techniques in ironic ways, without concern for their original intent. If the art world continues to be dominated by conceptual approaches, we should expect that the major innovators of the future will not only continue to emerge at very young ages, but that they will also be spread ever more widely across countries and continents.

Beyond Modern Art

> One of the most noteworthy statements in Vasari's *Life* of Titian, and possibly the most important one for an understanding of Rembrandt's development is the remark that behind the apparently effortless "*pittura di macchia*" (painting with splotches) lay a vast store of knowledge and experience. Vasari accordingly warned young artists not to attempt this technique, stressing ... that an artist should begin with a painstaking and fine technique and only adopt the rough manner later in life. Surveying Rembrandt's career, it is as if he took this advice very much to heart.
>
> Ernst van de Wetering, 2000[252]

Recent research has begun to indicate that the difference in conception and practice that has distinguished experimental and conceptual artists is not a phenomenon solely of the modern era, but that the two types can be identified much earlier.[253] Although the process of categorizing premodern artists has just started, an understanding of the distinction may serve to provide a coherent and unified framework for many of the features of the art of great painters of the past that have previously been regarded as unrelated or idiosyncratic.

An example is afforded by findings produced by recent analyses of Rembrandt's art. Although Rembrandt made hundreds of drawings, few appear to have been intended or used as preparatory works for his paintings.[254] Rembrandt did not begin his paintings with underdrawing on the primed canvas, but instead began painting directly with a brush, as he arrived at the forms in his paintings only in the course of executing them.[255] He developed his paintings slowly, returning to particular passages again and again: his "often laborious working of the paint" served to "call attention to invention as a process."[256] X-rays of his paintings reveal many pentimenti.[257] He found it difficult to complete his paintings, was apparently reluctant to let even commissioned works go, and he often left paintings unfinished.[258] Like other masters of his

day, Rembrandt had students and assistants in his studio, but unlike many other masters, he did not sign works produced by other members of his studio, and he never collaborated with these assistants: "His merging of invention with execution, his distinctive handling of the paint (or of the etched line), his invention and use of his signature presented his works and those of his studio as an extension of himself."[259]

Art historians have established each of these features of Rembrandt's practice separately, and have generally offered no unifying analysis for them. Yet all are consistent with the proposition that Rembrandt was an experimental artist. Also consistent with this proposition is Rembrandt's arrival late in life at what art historians have called an "'ultima maniera' - that magical apotheosis which typifies some artists' biographies."[260]

Among the greatest masters of the premodern era, a survey of evidence of this sort suggests that Masaccio and Raphael were conceptual innovators, and that Michelangelo and Titian, like Rembrandt, were experimental. Evidence on these artists' life cycles furthermore shows that art historians consider Masaccio and Raphael to have done their greatest work very early, and Michelangelo, Titian, and Rembrandt to have done theirs late in their careers.[261] Recognition of the differences between conceptual and experimental artists of the premodern era may resolve as many questions as it has for the modern period. Although this study is at an early stage, it appears to hold great promise in presenting a more systematic history of the development of Western art.

Beyond Art

> There is a line among the fragments of the Greek poet Archilochus which says: "The fox knows many things, but the hedgehog knows one big thing ..." [T]aken figuratively, the words can be made to

> yield a sense in which they mark one of the deepest differences which divide writers and thinkers, and it may be, human beings in general. For there exists a great chasm between those, on one side, who relate everything to a single central vision ... and, on the other side, those who pursue many ends... The first kind of intellectual and artistic personality belongs to the hedgehogs, the second to the foxes.
>
> Isaiah Berlin, 1953[262]

The implications of this research on the life cycles of modern artists may go not only beyond modern art, but beyond art in general. Since the pioneering research of Harvey Lehman in the 1950s, psychologists have taken an active interest in measuring the life cycles of creative people in a wide range of fine arts and academic disciplines. This has produced conclusions like those referred to earlier in this paper, that important mathematicians and poets have typically done their best work at younger ages than have important philosophers and novelists. Yet a potentially severe flaw with the psychologists' research can be illustrated by examining Lehman's study of painters. Lehman compiled a list of all the paintings mentioned in at least two of 60 different books on art history published between 1890 and 1939. This list contained 650 paintings by 168 different artists. Distributing these paintings by the artists' ages when the paintings were produced yields a curve which "exhibits a definite peak at 35 to 39," and Lehman concludes that "The consensus of experts suggests that the best oil paintings have been executed most frequently by artists from 35 to 39."[263] The theory and evidence considered above in this paper suggests that the construction of a single age distribution from evidence like that collected by Lehman potentially poses an enormous barrier to our understanding of creativity at the individual level. This is because it may conceal the existence of two distinct age distributions - for experimental and conceptual artists - with very different peaks. And this barrier may exist

not only for painters, but also for the many other activities that Lehman and his successors have generally analyzed at the aggregate level of the discipline.[264]

The most dramatic differences in creative life cycles may occur within, rather than across, disciplines. I believe it is likely that in all intellectual activities, including the fine arts as well as academic disciplines, there are important practitioners of both types described in this paper - experimental and conceptual - and that in all these activities there are consequently two distinct life cycles of creativity. If this is true, the differences psychologists have found across disciplines in the central tendency of important contributors' peak achievements by age may be largely a consequence of differences across disciplines in the relative numbers of the two types of innovator. The results noted above would thus indicate that a larger proportion of important mathematicians and poets have been conceptual innovators than has been the case for important philosophers and novelists.

I am currently studying the careers of Nobel laureates in economics and of important American poets of the 20th century. Although neither study is complete, I can present preliminary results that appear to demonstrate that both of these groups of creative people include both conceptual young geniuses and experimental old masters.

The study of the life cycles of the eminent economists is based on an analysis of all the citations to their work recorded in the Social Science Citation Index for the years 1970-2000.[265] A straightforward measure of the timing of each scholar's single most important contribution is to locate the year from which their publications received the most citations. Table 13 presents this measure for ten Nobel laureates. These are only a subset of all the laureates in economics, who now total more than 50. Yet it is clear that Kenneth Arrow, Gary Becker, Paul Samuelson,

and Robert Solow are among the most important economic theorists of the second half of the 20th century, just as Milton Friedman, Simon Kuznets, and Theodore Schultz are among the most important empirical economists of the same era.

The difference in the timing of these scholars' major contributions is striking. Thus whereas the four theorists named above published their most-cited work during the ages of 30-34, the three empiricists published theirs at ages ranging from 41 to 62. In addition, Table 13 shows that the mathematician John Nash published his seminal contribution to game theory at the age of just 22, but that the two economic historians who have won the Nobel Prize, Robert Fogel and Douglass North, published their most-cited work at the considerably more advanced ages of 48 and 70, respectively.

Modern economic theory is studied at a very high level of abstraction, and there is no doubt that successful theorists, who work deductively, are conceptual innovators. In contrast, modern empirical economics is based on the analysis of large bodies of data. Successful practitioners are typically highly skilled at drawing inferences from abundant evidence, and most work inductively, and thus experimentally. Table 13 therefore shows that several of the most important conceptual economists of the past half century produced their most important work very early in their careers, and that several of the most important experimental economists of the same era published their most important work considerably later in their careers.

My study of poets' life cycles is based on an analysis of the frequency with which their poems are reprinted in anthologies. A straightforward measure of the timing of their major contributions is again the year of their careers from which the anthologies contain the largest number of entries. Table 14 presents this measure for nine important twentieth-century

American poets, tabulated from a total of 44 anthologies published since 1980. The table also shows the percentage of each poet's total entries in the anthologies that were written before the poet reached the age of 40.

T. S. Eliot and Ezra Pound are both known for their precocity as poets, and specifically for the technical excellence of their early work. Eliot wrote "The Love Song of J. Alfred Prufrock" at the age of just 23, when he was still a graduate student at Harvard. Although he would later produce other landmark works, many consider "Prufrock" not only "the basic Eliot poem," but also "perhaps the most famous [poem] ever written by an American."[266] Noting the technical mastery and sophisticated tone of Eliot's early work, one scholar commented that he "seems never to have been a young man."[267] At the age of 34 Eliot published his monumental work, *The Waste Land*, "which seemed to change English poetry for good."[268] Eliot's poetry was based on a vast knowledge of literary history, and its academic orientation made its intellectual appeal to young poets very strong; thus William Carlos Williams, who hoped to move American poetry in a very different direction, later remarked that Eliot's work "wiped out our world as if an atomic bomb had dropped on it."[269]

Ezra Pound published five volumes of poems by the age of 30, and this early output is marked by "an astonishing display of variety and versatility," with "poems in a wide range of styles and modes".[270] The achievement was primarily in technique: "Pound is more interested in the technical elements of the poem than its subject. His poetry of this period is a learned poetry rather than one that grows from personal experience."[271]

In contrast, William Carlos Williams' poetry developed more gradually, "his radical and distinctly American style emerging more and more assuredly with each successive book."[272]

Williams lacked the technical facility and clarity of purpose of Eliot and Pound: "if ability to handle abstractions is taken as *the* mark of intelligence, then he was also very much less 'intelligent' than ... Eliot or Pound ... He could never resolve in his mind what he was trying to do as a poet."[273] Yet Williams' enterprise differed from those of Eliot and Pound, as he wanted "to invent a poetry rooted in American speech and experience, to convey a sense of felt life in his work by bringing poetry down from the pedestal of high art and locating it firmly in the familiar terrain of the poet's immediate environment."[274]

Robert Lowell also arrived at his mature style relatively late. *Life Studies*, published when Lowell was 42, was quickly recognized as an important achievement for its introduction of what became known as confessional poetry. The poet Donald Hall observed that "Lowell was not the first poet to undertake great change in mid-career, but he was the best poet to change so much." This change involved a loosening of structure, as Lowell "abandoned syllabic tightness and formal diction for idiom, improvisation, surprise, and for details of the American scene."[275] Lowell's poetry was open-ended, as he constantly revised old poems, for "what he was after was not so much a poem as a poetic process - something that denied coherence, in the traditional sense, and closure."[276]

Lowell's introspective writing about his own troubled life inspired many younger poets to create autobiographical works. Sylvia Plath was among these, as she wrote that *Life Studies* excited her with "this intense breakthrough into very serious, very personal emotional experience."[277] She followed Lowell in writing vividly and painfully about her personal life. Yet her innovative contribution lay not in subject matter but in her language, with "her use of metaphors so strong that they displace what they set out to define and qualify."[278] Plath's most

celebrated poems date from the final two years of her life, before her suicide at the age of 31. During this time she wrote "at top speed, as one might write an urgent letter," and she frequently began and completed a poem in a single day.[279] She had no doubt that this was her best work, as in October, 1962, four months before her death, she wrote to her mother that "I am writing the best poems of my life; they will make my name."[280]

Robert Frost made the people of New England his subject. His carefully metered rhythms transferred their conversational language and diction into poetry. One scholar noted that "no poet of the twentieth century, with the exception of William Carlos Williams, has placed so much emphasis on the spoken language as the source of poetry."[281] Frost believed that poems should not be carefully planned or rehearsed, but that their composition should be a process of immediacy and discovery. Thus in the preface to his collected poems he declared:

> No tears in the writer, no tears in the reader. No surprise for the writer, no surprise for the reader. For me the initial delight is in the surprise of remembering something I didn't know I knew.[282]

Frost matured slowly as a poet, and he believed strongly that the wisdom that came from experience was more valuable than the more intense but less sustained brilliance of youth. So for example he wrote in 1937, at the age of 63, that:

> Young people have insight. They have a flash here and a flash there ... It is later in the dark of life that you see forms, constellations. And it is the constellations that are philosophy.[283]

Wallace Stevens emphasized that his poetry grew from real experiences. Thus he once wrote to a friend that "While , of course, my imagination is a most important factor, nevertheless I wonder whether, if you were to suggest any particular poem, I could not find an actual background for you."[284] Stevens did not make precise plans or outlines for his poems, but

improvised as he wrote. One critic observed that "he loved the process of thinking, not the thought that presses for a conclusion."[285] Robert Lowell faulted Stevens for his casual execution, declaring that "few poets of Stevens's stature have tossed off so many half-finished improvisations," but nonetheless praised him for "understanding with the understanding of having lived long."[286] On the occasion of Stevens' 75th birthday, William Carlos Williams observed that Stevens' work had not reached its full power until late in his life, and concluded that

> It is a mark of genius when an accomplished man can go on continually developing, continually improving his technique as Stevens shows by his recent work ... Patiently the artist has evolved until we feel that should he live to be a hundred it would be as with Hokusai a perspective of always increasing power over his materials until the last breath.[287]

Gwendolyn Brooks is known for bringing the common language and everyday experiences of black Americans into poetry. Her best work came only after a long period of development, as she gradually abandoned the academic style and elegant phrases of her early poetry in favor of looser forms and more idiomatic language. Her most reprinted poem, "We Real Cool," published when Brooks was 43, tersely portrayed the rebellious attitudes and violent lives of poor urban blacks.[288]

Richard Wilbur is praised for being "witty, versatile, good-humored, intelligent, and technically dazzling," and for writing "elegant exquisitely regular, jewel-like verse."[289] His poetry is concerned with form rather than substance: "the subject of a poem need not be in any sense great; the death of a toad would do nicely ... This was art, not life."[290] Although Wilbur's early work is highly regarded, there is a critical consensus that "Wilbur has changed or

developed very little in his eight collections of verse."[291]

In an essay published in 1946, the English poet Stephen Spender wrote that

> I make a sharp distinction between two types of concentration: one is immediate and complete, the other is plodding and only completed in stages. Some poets write immediately works which, when they are written, scarcely need revision. Others write their poems by stages, feeling their way from rough draft to rough draft, until finally, after many revisions, they have produced a result which may seem to have very little connection with their early sketches.[292]

Spender's two categories of poets appear to correspond directly to those developed for painters in the present study. Thus it seems likely that poets who produce immediately are conceptual, while those who work in stages are experimental. The brief survey of the nine American poets considered here might suggest that Eliot, Pound, Wilbur, and Plath belong in the first of Spender's groups, and Frost, Stevens, Williams, Lowell, and Brooks in the second. The logic of this division is that the more highly literary and technical contributions of the first four could be made quickly, whereas the efforts of the second group at transforming real experiences into art would require more time. Spender himself appears to have recognized this difference in the time required by the two types, for he observed that "the difference between the two types of genius is that one type ... is able to plunge the greatest depths of his own experience by the tremendous effort of a moment, the other ... must dig deeper and deeper into his consciousness, layer by layer." [293] The quantitative measures of Table 14 show that Pound, Eliot, Wilbur, and Plath all made their most valued contributions by the age of 30, whereas Frost, Stevens, Williams, Brooks, and Lowell only found their voice later, usually after the age of 40. Thus the evidence of these poets' single best years suggests that great conceptual poets, who innovate through the

"effort of a moment," tend to arrive at their major contributions considerably earlier in their careers than great experimental poets, who must engage in a more time-consuming process of exploring their own consciousness "layer by layer." And the evidence of the age distributions of their anthology entries furthermore suggests that the conceptual poets had made the bulk of their original contributions before the age of 40, while the experimental poets made most of theirs after that age.

Systematic studies of the careers of significant numbers of innovators in other intellectual disciplines remain to be carried out, but it seems apparent from the evidence examined to this point for painters, economists, and poets that there are strong ties in this wide range of activities between creative individuals' working methods and their life cycles. Obvious examples appear in other settings. Thus Virginia Woolf appears to be a clear example of an experimental novelist who reached the peak of her achievement after the age of 40. In 1928 Woolf wrote an introduction to *Mrs. Dalloway*, which had first been published three years earlier. In it she took pains to deny the claim that the book was "the deliberate offspring of a method." Although Woolf admitted that she had been dissatisfied with the forms of fiction that were then in use, she insisted that *Mrs. Dalloway* was anything but a planned or systematic reaction to this feeling. Rather, she wrote,

> the idea started as the oyster starts or the snail to secrete a house for itself. And this it did without any conscious direction. The little note book in which an attempt was made to forecast a plan was abandoned, and this book grew day by day, week by week, without any plan at all, except that which was dictated each morning in the act of writing. The other way, to make a house and then inhabit it, as Wordsworth did and Coleridge, is, it need not be said, equally good and much more philosophic. But in the present case it was necessary to write the book first and to invent a theory

> afterwards.[294]

When Woolf wrote this description of her experimental approach she was 46 years old. Six years earlier, she had noted in her diary that she had "found out how to begin (at 40) to say something in [her] own voice."[295] Later critics would agree with Woolf's assessment, generally considering her finest period to begin with *Mrs. Dalloway*.[296]

A biographer observed of Woolf that "Even more than other novelists who have recorded the birth and growth of their works, she appears to begin without any detailed knowledge of how she will proceed."[297] Like many experimental painters, this uncertainty persisted throughout Woolf's process of composition. Thus having begun *To the Lighthouse* early in 1926, on September 5 Woolf noted in her diary that "At this moment I'm casting about for an end ... [W]hat becomes [of] Lily & her picture?"[298] Woolf later recorded that she had "finished, provisionally," 11 days later.[299] The final sentences of the novel in fact describe the moment when the experimental artist Lily Briscoe completed her painting:

> [S]he looked at her canvas; it was blurred. With a sudden intensity, as if she saw it clear for a second, she drew a line there, in the centre. It was done; it was finished. Yes, she thought, laying down her brush in extreme fatigue, I have had my vision.[300]

Allowing Lily to achieve her vision may have reflected not only Woolf's satisfaction at her achievement in the novel but also a judgment of her own creative life cycle. Lily was 44 at the novel's end, the same age as Woolf herself, and she would later write in her diary that "With The Lighthouse I may just have climbed to the top of my hill."[301]

Conclusion

> Why do you think I date everything I make? Because it's not enough to know an artist's works. One must also know when he

> made them, why, how, under what circumstances. No doubt there will some day be a science, called "the science of man," perhaps, which will seek above all to get a deeper understanding of man via man-the-creator. I often think of that science, and I want the documentation I leave to posterity to be as complete as possible. That's why I date everything I make.
>
> Pablo Picasso, 1943[302]

A number of art scholars have been aware of the dramatic difference in working methods between painters who seek and those who find. Yet perhaps only Roger Fry has understood the remarkable difference in the career patterns of these two types of painter, with young geniuses making radical conceptual leaps, and old masters arriving at their innovations only after years of cautious experimentation.

This paper has documented the differences in working methods between conceptual and experimental artists for a significant number of important modern painters, and has shown that these differences are clearly associated with contrasting life cycles of innovation. The paper has also pointed out a number of important implications for the history of modern art of the recognition of the two approaches and their corresponding life cycles.

The research done to date has only begun to develop this subject. Much more work remains to be carried out before its implications for modern art are fully understood. The hostility and incomprehension of art historians who reject systematic measurement and social scientific methods should not be allowed to deter the pursuit of this research. With the prospect of this revolution in our understanding of a discipline, art history is too important, and too exciting, to be left to art historians. And beyond modern art may lie not only a richer understanding of the history of premodern painting, but a new and more comprehensive approach to the analysis of human creativity in all intellectual activities.

Footnotes

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68. George Kubler, *The Shape of Time* (New Haven: Yale University Press, 1962), p. 10.

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70. Maurice Tuchman and Stephanie Barron, *David Hockney: A Retrospective* (Los Angeles: Los Angeles County Museum of Art, 1988), p. 87.

71. Michael Baxandall, *Patterns of Intention* (New Haven: Yale University Press, 1985), Chapters 1-2.

72. Meyer Schapiro, *Worldview in Painting - Art and Society* (New York: George Braziller, 1999), pp. 142-43.

73. Kubler, *The Shape of Time*, p. 10.

74. Referring to art and literature, the sociologist Pierre Bourdieu observed that "There are in fact very few other areas in which the glorification of 'great individuals,' unique creators irreducible to any condition or conditioning is more common or uncontroversial;" *The Field of Cultural Production* (New York: Columbia University Press, 1993), p. 29.

75. As is the case for scholars, the initial recognition of important artists is typically by their fellow artists. See the interesting comments by Alan Bowness, *The Conditions of Success: How the Modern Artist Rises to Fame* (New York: Thames and Hudson, 1989).

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80. Roger Fry, *Last Lectures* (Boston: Beacon Press, 1962), pp. 3, 14-15.

81. Kubler, *The Shape of Time*, p. 83.

82. Harold Rosenberg, *Art on the Edge* (Chicago: University of Chicago Press, 1983), p. 80.

83. Rewald, *The Paintings of Paul Cézanne*.

84. A regression in which the binary dependent variable was equal to 1 for paintings owned by museums, and 0 otherwise, produced the following estimate (t-statistics are given in parentheses):
Probability of museum ownership = .249 + .0041 age at execution
(4.04) (3.08)

n=945, R^2=.01

85. Thus for example eight paintings by Cézanne appeared in four or more of the textbooks surveyed for Galenson, "Quantifying Artistic Success," footnote 1, p. 17. The mean size of these eight paintings was 2,151 sq. in. This is more than three times as large as the overall mean, of 657 sq. in., of all Cézanne's paintings in Rewald's catalogue raisonné.

86. A regression with the natural logarithm of a painting's surface area in square inches yields the following estimate:
Ln(size) = 4.86 + 0.22 age at execution +.337 museum ownership
(43.7) (9.33) (5.80)

n=945, R^2=.124
Thus controlling the age at which the painting was made, paintings by Cézanne owned by museums at the time of publication of Rewald's catalogue were on average one-third larger than those privately owned.

87. These results for Cézanne are likely to extend to other artists as well. It will be demonstrated below that art scholars' judgments of when artists have done their best work generally agrees with market valuations. As a result, because these best works are most sought after by museums, the auction market will generally understate the true value of work from the artist's best period relative to that of the rest of is career. This effect typically serves to strengthen the usefulness of using auction data to date the timing of the artist's best work.

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95. Valéry, *Degas, Manet, Morisot*, p. 50.

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137. On the selection of these ten artists, see David W. Galenson, "Was Jackson Pollock the Greatest Modern American Painter? A Quantitative Investigation," *Historical Methods*, Vol. 35, No. 3 (Summer 2002), Table 2, p. 119.

138. Bowness, *The Conditions of Success*, pp. 9-11.

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141. Christina Duff, "In Payscales, Life Sometimes Imitates Art," *Wall Street Journal* (May 22, 1998), p. B1.

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Figure 1: Age − Price Profile for Paul Cezanne

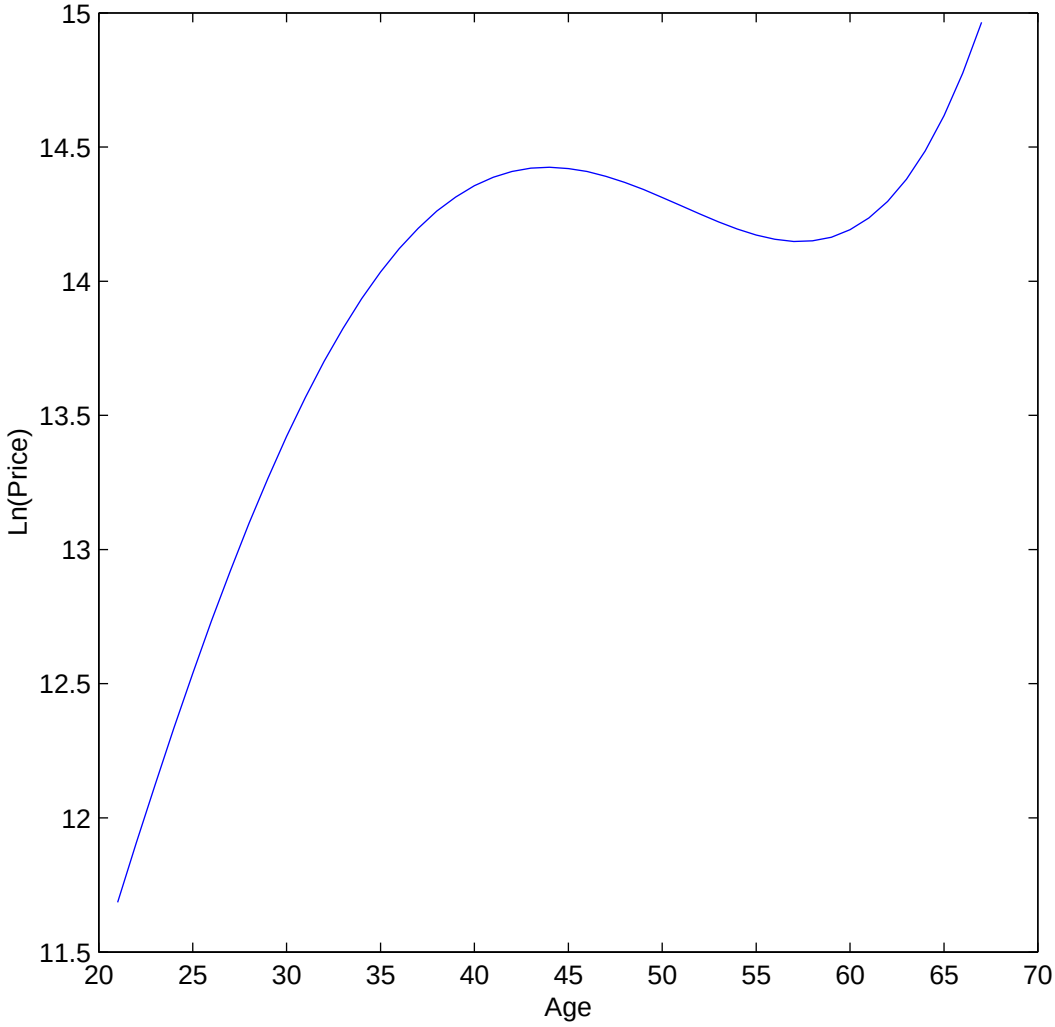

Figure 2: Age − Price Profile for Pablo Picasso

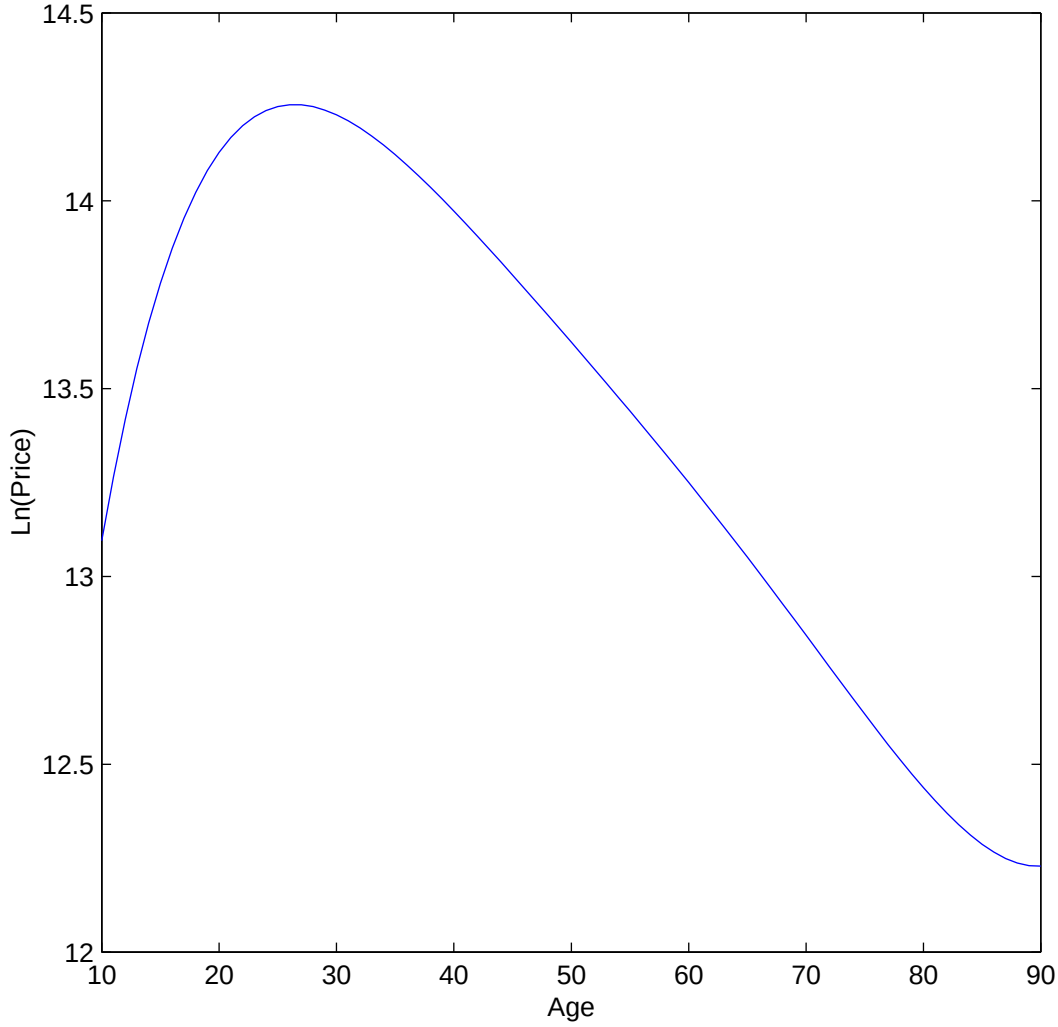

Table 1: Illustrations by Age, Cézanne and Picasso, from Books Published in English

Age	Cézanne		Picasso	
	n	%	n	%
10 - 19	0	0	3	1
20 - 29	3	2	127	38
30 - 39	21	16	85	25
40 - 49	30	22	64	19
50 - 59	33	24	46	14
60 - 69	49	36	5	2
70 - 79			3	1
80 - 89			0	0
90 - 92			0	0
Total	136	100	333	100
Age with most illustrations	67		26	

Source: Tabulated from books listed in David W. Galenson, "Quantifying Artistic Success: Ranking French Painters - and Paintings - from Impressionism to Cubism," *Historical Methods*, Vol 35, No. 1 (Winter 2002), p. 17, fn. 1.

Table 2: Illustrations by Age, Cézanne and Picasso, from Books Published in French

Age	Cézanne		Picasso	
	n	%	n	%
10 - 19	0	0	0	0
20 - 29	7	6	77	38
30 - 39	15	13	44	22
40 - 49	29	25	27	13
50 - 59	30	26	34	17
60 - 69	34	30	8	4
70 - 79			7	3
80 - 89			5	2
90 - 92			0	0
Total	115	100	203	100
Age with most illustrations	67		26	

Source: Tabulated from books listed in David W. Galenson, "Measuring Masters and Masterpieces: French Rankings of French Painters and Paintings from Realism to Surrealism," *Histoire et Mesure*, Vol. XVII, No. 1-2 (2002) Appendix, pp. 83-85.

Table 3: Peak Ages, Ten Early Modern Artists

Artist Age At:	Peak Value	Peak Illustrations	
		American texts	French texts
Experimental			
Camille Pissarro (1830-1903)	45	43	47
Edgar Degas (1834-1917)	46	42	43
Wasily Kandinsky (1866-1944)	52	47	--
Georgia O'Keeffe (1887-1986)	48	39	--
Jean Dubuffet (1901-1985)	46	53	46, 59, 83
Conceptual			
Edvard Munch (1863-1944)	34	30	--
André Derain (1880-1954)	24	25, 26	26
Georges Braque (1882-1963)	28	29	31
Juan Gris (1887-1927)	28	28	25
Giorgio de Chirico (1888-1978)	26	26	--

Sources: Age at peak value: Galenson, *Painting outside the Lines*, Tables 2.1, 2.2. For artists who do not appear in those tables, prices were estimated as described there.

Age at peak illustrations: Galenson, "Quantifying Artistic Success;" Table 5; Galenson, "Measuring Masters and Masterpieces," Table 5; Galenson, "The New York School vs. the School of Paris: Who Really Made the Most Important Art after World War II?" *Historical Methods*, Vol. 35, No. 4 (Fall 2002), pp. X-y; Galenson, "Toward Abstraction: Ranking European Painters and Paintings of the Early Twentieth Century," in preparation; Galenson, "Before Abstract Expressionism: Ranking American Painters and Paintings of the Early Twentieth Century," in preparation.

The entry given is the artist's age in the single year from which the textbooks reproduce the largest number of the artist's paintings.

Table 4: Distribution by Artist's Age of Paintings Included in Retrospective Exhibitions, Cézanne and Picasso

	Cézanne		Picasso	
	n	%	n	%
10 - 19	0	0	25	3
20 - 29	13	6	212	28
30 - 39	42	18	134	18
40 - 49	61	27	78	10
50 - 59	56	24	149	20
60 - 69	57	25	64	8
70 - 79			56	7
80 - 89			35	4
90 - 92			3	0
Total	229	100	756	
Age with most illustrations	67		26	

Source: Françoise Cachin, Isabelle Cahn, Walter Feilchenfeldt, Henri Loyrette, and Joseph J. Rishel, *Cézanne* (New York: Harry N. Abrams, 1996); William J. Rubin, editor, *Pablo Picasso: A Retrospective* (New York: Museum of Modern Art, 1980).

Table 5: Peak Ages, Ten American Painters

Artist Age At:	Peak Value	Peak Textbook Illustrations	Peak for Works in Retrospective
Experimental			
Mark Rothko (1903-70)	54	54	46
Arshile Gorky (1904-48)	41	40	43
Willem de Kooning (1904-97)	43	48	45
Barnett Newman (1905-70)	40	46	44
Jackson Pollock (1912-56)	38	38	36
Conceptual			
Roy Lichtenstein (1923-97)	35	40	39
Robert Rauschenberg (1925-)	31	34	35
Andy Warhol (1928-87)	33	34	34
Jasper Johns (1930-)	27	25	28, 29, 32
Frank Stella (1936-)	24	23	25

Sources: Age at peak value: Galenson, *Painting outside the Lines*, Table 2.2.

Age at peak textbook illustrations: Galenson, "Was Jackson Pollock the Greatest Modern American Painter?" Table 5.

Age at peak number of works in retrospective: tabulated from retrospective catalogues listed in Galenson, *Painting outside the Lines*, Table B.1.

Table 6: Ages at Which Artists Included in Table 3 Executed Paintings Reproduced in *An Invitation to See*

Artist	Age at execution of MoMA paintings	Age at peak value
Experimental		
Pissarro	--	45
Degas	48	46
Kandinsky	48, 48, 48, 48	52
O'Keeffe	42	48
Dubuffet	50, 60	46
Conceptual		
Munch	--	34
Derain	27	24
Braque	30, 31, 55	28
Gris	27	28
de Chirico	29	26

Sources: Age at execution of MoMA paintings: Franc, *An Invitation to See*.

Age at peak value: see Table 3.

Table 7:Ages at Which Artists Included in Table 5 Executed Paintings Reproduced in *An Invitation to See*

Artist	Age at execution of MoMA paintings	Age at peak value
Experimental		
Rothko	55	54
Gorky	43	41
de Kooning	48	43
Newman	46	40
Pollock	31, 38	38
Conceptual		
Lichtenstein	40	35
Rauschenberg	30	31
Warhol	34	33
Johns	25, 31	27
Stella	29	24

Sources: see Table 5.

Table 8: Illustrations by Age, Monet, from Books Published in English and in French

Age	English		French	
	n	%	n	%
20 - 29	28	22	25	24
30 - 39	42	34	43	41
40 - 49	6	5	2	2
50 - 59	27	22	18	17
60 - 69	5	4	6	6
70 - 79	4	3	10	10
80 - 86	13	10	0	0
Total	125	100	104	100

Source: see text.

Table 9: Ranking of Paintings of French Artists, by Total Illustrations in American Textbooks

Rank	Illustrations	Artist, title	Date	Location
1	30	Picasso, *Les Demoiselles d'Avignon*	1907	New York
2	25	Picasso, *Guernica*	1937	Madrid
3	24	Seurat, *Sunday Afternoon on the Island of the Grande Jatte*	1886	Chicago
4(t)	21	Duchamp, *Nude Descending a Staircase, No. 2*	1912	Philadelphia
4(t)	21	Manet, *Le Déjeuner sur l'herbe*	1863	Paris
6	20	Manet, *A Bar at the Folies-Bergère*	1882	London
7	16	Duchamp, *The Bride Stripped Bare by Her Bachelors, Even*	1923	Philadelphia
8(t)	15	Courbet, *L'Atelier*	1855	Paris
8(t)	15	Gauguin, *The Vision After the Sermon*	1888	Edinburgh
8(t)	15	Manet, *Olympia*	1863	Paris
8(t)	15	Matisse, *The Joy of Life*	1906	Merion

Source: Galenson, "Quantifying Artistic Success," Table 3, p. 8.

Table 10: Ranking of Paintings by French Artists, by Total Illustrations in French Textbooks

Rank	Illustrations	Artist, title	Date	Location
1	25	Picasso, *Les Demoiselles d'Avignon*	1907	New York
2	18	Manet, *Olympia*	1863	Paris
2(t)	18	Picasso, *Guernica*	1937	Madrid
4	17	Seurat, *Sunday Afternoon on the Island of the Grande Jatte*	1886	Chicago
5	16	Manet, *Le Déjeuner sur l'herbe*	1863	Paris
6	14	Duchamp, *Nude Descending a Staircase, No. 2*	1912	Philadelphia
7	13	Monet, *Impression, Sunrise*	1872	Paris
8(t)	12	Courbet, *Burial at Ornans*	1850	Paris
8(t)	12	Duchamp, *The Bride Stripped Bare by Her Bachelors, Even*	1923	Philadelphia
10 (t)	11	Courbet, *Young Women on the Banks of the Seine*	1856	Paris
10(t)	11	Gauguin, *The Vision After the Sermon*	1888	Edinburgh
10(t)	11	Rousseau, *The Snake Charmer*	1907	Paris

Source: Galenson, "Measuring Masters and Masterpieces," Table 3, p. 54.

Table 11: Number of Entries by Selected Artists at Impressionist Exhibitions

Artist	Year							
	1874	1876	1877	1879	1880	1881	1882	1886
Cassatt	--	--	--	11	16	11	--	7
Cézanne	3	--	16	--	--	--	--	--
Degas	5	5	25	25	12	8	--	15
Monet	9	18	30	29	--	--	35	--
Morisot	9	17	12	--	15	7	9	14
Pissarro	5	12	22	38	16	28	36	19
Renoir	3	18	21	--	--	--	17	--
Sisley	5	8	17	--	--	--	27	--

Source: Charles S. Moffett, *The New Painting: Impressionism 1874-1886* (San Francisco: Fine Arts Museums of San Francisco, 1986).

Table 12: Ages of American Artists at the Time of Their First One-Man New York Gallery Exhibitions

Artist	Year of birth	Year of show	Artist's age
Experimental			
Adolph Gottlieb	1903	1930	27
Mark Rothko	1903	1933	30
Arshile Gorky	1904	1938	34
Willem de Kooning	1904	1948	44
Clyfford Still	1904	1946	42
Barnett Newman	1905	1950	45
Franz Kline	1910	1950	40
William Baziotes	1912	1944	32
Jackson Pollock	1912	1943	31
Philip Guston	1913	1945	32
Robert Motherwell	1915	1944	29
Conceptual			
Roy Lichtenstein	1923	1951	28
Larry Rivers	1923	1951	28
Robert Rauschenberg	1925	1951	26
Sol LeWitt	1928	1965	37
Cy Twombly	1928	1955	27
Andy Warhol	1928	1962	34
Jasper Johns	1930	1958	28
James Rosenquist	1933	1962	29
Jim Dine	1935	1960	25
Frank Stella	1936	1960	24
David Hockney	1937	1964	27
Robert Mangold	1937	1964	27

Source: Galenson, *Painting outside the Lines*, Appendix C.

Table 13: Ages at Which Selected Nobel Laureates in Economics Published their Most-Cited Work

	birth year	peak age
Conceptual		
Kenneth Arrow	1921	30
Gary Becker	1930	34
John Nash	1928	22
Paul Samuelson	1915	32
Robert Solow	1924	33
Experimental		
Robert Fogel	1926	48
Milton Friedman	1912	41
Simon Kuznets	1901	54
Douglass North	1920	70
Theodore Schultz	1902	62

Source: see text.

Table 14: Peak Ages of Selected American Poets

	birth year	peak age	percentage of anthology entries written before age 40
Conceptual			
Ezra Pound	1885	28	80
T. S. Eliot	1888	23	72
Richard Wilbur	1921	27	65
Sylvia Plath	1932	30	100
Experimental			
Robert Frost	1874	42	8
Wallace Stevens	1879	36	20
William Carlos Williams	1883	40	22
Gwendolyn Brooks	1917	43	42
Robert Lowell	1917	41	18

Source: see text.