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CHAPTER VIII

Arts Education, Human Development, and the Quality of Experience

MIHALY CSIKSZENTMIHALYI AND ULRICH SCHIEFELE

Introduction: Do the Arts Really Matter?

A generally held view is that knowledge in the natural sciences and mathematics is more important for the well-being and survival of humankind than any other area of knowledge or experience. This commonsense view is also reflected in the policies of governments and major research foundations which invest the larger part of their funds in the "hard" sciences. In the context of this cultural atmosphere it seems absurd to give public support to people just to enable them to live as painters, sculptors, or musicians. The educational system, which usually mirrors the values of society, also gives only marginal importance to arts and music instruction.[1]

But this minor role assigned to the arts in society and education needs to be questioned. There are at least three major reasons for rethinking these political and educational priorities. The first reason is that the technical progress made possible by intensive research in physics and the other sciences is at least as threatening for man's future as it is beneficial. At the very least, it seems desirable to slow down the development and production of energy-consuming goods and to direct human creativity increasingly to other fields of meaningful activity and production.[2] Second, the increasing automatization of production, the decreasing amount of working time, and the increasing average age of the population pose problems about the use of free time.[3] The reception as well as the production of artistic products (e.g., pictures, photographs, poems, prose, music) should

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provide people with a valuable alternative to watching TV, to being bored, or to engaging in dull, energy-consuming, or environmentally damaging leisure activities. The third reason for assigning more significance to arts education lies in its possible value for human evolution and for the development of the individual human being. The last assertion will be scrutinized now more closely.

Aesthetic Cognition and Human Development

Artistic activities, cognitions, and experiences appear to have significant functions in the course of phylogenetic and ontogenetic development.[4] Past accounts of human evolution have, however, clearly favored the acquisition of rational knowledge as it is represented by the sciences and mathematics. It is true that rational cognition has unequivocally proved its function as a tool for adaptation to the world around us. Rational cognition has made it possible for humankind to predict external events and thus master obstacles and make use of the environment for its own purpose.[5] Its power is very much based on the precision with which phenomena can be analytically defined and labeled, and on the assumption that things in the world can be assigned to single, mutually exclusive categories (i.e., Aristotle's principle of noncontradiction).

These features of rational thought, which contribute a great deal to its usefulness, are at the same time responsible for its constraints. When it comes to basic human affairs, such as feelings and social relationships, a rational system based on precise analytic assumptions ceases to be an adequate representation of reality. A straightforward quantitative approach would disguise these complex and ambiguous phenomena rather than clarify them. Furthermore, seemingly contradictory feelings like love and hate can be experienced almost at the same time. Thus, it seems questionable that the assumption of noncontradiction, which excludes the possibility that a thing can at the same time be its opposite, is a correct model for describing all aspects of reality. The obvious constraints of rational thought led Wittgenstein to demand that "What we cannot speak about we must pass over in silence."[6] He maintained that the rationality of science is not able to deal with those issues that are the most essential to everyday life—such as death, religion, ways of living, the meaning of work and life. It follows that the development of more and more specific rules for scientific reasoning results in the exclusion of ever larger amounts of thought and experience. Although reasoning has

proved itself adaptive, there is justified doubt that increasing the powers of reason at the expense of other modes of knowing will ultimately lead to greater understanding.

Some theorists have explored the role of aesthetic cognition as a complementary alternative to rational cognition.[7] It is generally agreed that both science and art are symbolic systems that provide knowledge. However, their respective procedures and the nature of the resulting knowledge are quite different. Unlike science, art represents experienced reality that is ambiguous, contradictory, and partly unconscious. Artistic cognition is based on symbolic rules that are holistic, idiosyncratic, and implicit rather than explicit. The products of art do not represent unequivocal pictures of reality that can be tested empirically.

Were mankind to rely only on this type of knowledge, it would not be able to survive. The merits of aesthetic cognition, however, are as a corrective to an exclusively rational approach. Aesthetic cognition gains its evolutionary value by providing models or descriptions of internal and external realities which cannot be represented by purely rational means. As Getzels and Csikszentmihalyi have shown, artists most often deal with basic existential questions that cannot be answered by scientific reasoning.[8] In *A Portrait of the Artist as a Young Man*, James Joyce provides a nice example for this basic aspect of the artistic endeavor when at the end of the book Stephen Daedalus says: "Welcome, O life! I go to encounter for the millionth time the reality of experience and to forge in the smithy of my soul the uncreated conscience of my race."[9]

In dealing with as yet unexpressed existential human problems, the artist might be regarded as part of the avant garde that creates new concepts and new rules of thinking, and thus may lead rational thought to expand its borders and to reach higher levels. While rational cognition gains control over reality by drastically reducing it to its basic quantifiable aspects, art models phenomena in a more global and analogic way that also tolerates contradictions between constitutive elements.

The contribution of artistic models of reality to the evolution of human thought also appears on the level of individual development. This is especially true for those who actively engage in the creative production of art. Getzels and Csikszentmihalyi have provided numerous examples of painters and sculptors who use their work to express personal problems and basic life themes.[10] The process of visual expression clearly helps gain some control and understanding of

barely conscious internal tensions, diffuse problems, or felt ambiguities. "The key to creative achievement is the transformation of an intangible conflict into a tangible symbolic problem to which the creative solution will be the response."[11]

A second function of arts-related activities at the level of individual development is helping the person to maintain the cognitive structure of the self. The sum of all activities a person is engaged in defines a great deal of the person's self. This is especially, and perhaps only, true for intentional and self-determined activities.[12] As the creation of art is by definition an intentional and self-determined activity, it should contribute to what a person defines as his or her being. This contrasts with other ways people strive to reassure themselves that their self is an autonomous and powerful agent, for example, through the possession of material objects, the control of physical energy, and the control of other people's psychic energy.

In this section we have shown that there are important differences between rational thought, as it is represented by the sciences and mathematics, and aesthetic knowledge produced by creating or responding to art. It was our intention to show that the two domains complement each other, by fostering cognizance of different dimensions of reality. Our analysis suggests that creating, responding to, or learning about art have more relevance for people's everyday life experience and their existential struggles than do the natural and technical sciences. If one wants to find a suitable way of living or to understand how another person feels, mathematical equations, physical laws, or sophisticated computer programs won't provide much help. It may be argued that psychological knowledge will bring helpful advice. While this is certainly true for some well-defined problems, psychological knowledge cannot solve many basic existential problems with which we have to struggle. In addition, it is interesting to note that many therapeutic techniques encourage the patient to engage in activities that resemble those of an artist: interpretation of dreams, illogical associative thinking, mental visualization, holistic thinking, painting, psychodrama, and focusing on inner mental and bodily states.[13]

Jung wrote that when rationalizing and "normalizing" cease to help the client then therapy has to follow the client's idiosyncratic and "irrational" thought patterns.[14] In this phase of the therapy, the therapist is no longer treating the client but seeks to facilitate the development of the client's creative potential. To achieve this goal, Jung relied mainly on dreams. Moreover, it is a crucial part of the

process of dream analysis that the client paints or draws his or her dreams. According to Jung, this is the only means of decoding the hidden meaning of a dream and of turning it into a subjectively helpful insight. It is not necessary that the therapist understand the client's dream intellectually; what counts is that the client arrives at a subjectively meaningful interpretation.

Finally, perhaps the major difference between rational knowledge and artistic knowledge is in terms of their outcomes. Whereas we use reason generally as an instrumental tool in order to achieve some external good (a better prediction, a more efficient procedure), the use of artistic representation is an end in itself; it generates its own enjoyment and its own meaning regardless of future consequences. The enlightenment a work of art produces in the artist and in the viewer enhances the quality of life here and now, and needs no further justification. To the extent that the quality of life is the highest good toward which all our activities tend, it can be argued that art contributes to it directly, whereas sciences and technology do so only indirectly.

If there is validity to these distinctions between rational and artistic cognition, then one would expect that the quality of experience is rather different in these realms. More specifically, we assume that young people engaged in arts-related activities have a more positive experience than when engaged in solving mathematical problems or when learning about physical facts. Whether this is true or not, and what the resulting consequences are for teaching, is the question addressed in the following sections.

The Significance of Arts in Everyday Life: Evidence from Case Studies

The empirical data reported in this chapter are part of a large-scale longitudinal study of talented adolescents.[15] The study involves 208 freshmen and sophomores from two high schools who were studied for a period of five years to determine some of the causes of disengagement from talent. These students were among 535 nominated by teachers as having outstanding talent in either arts, athletics, music, mathematics, or science (74 percent were nominated in one area only, while 26 percent were nominated in two or more areas). Data were obtained through questionnaires, interviews, and the administration of the Experience Sampling Method (ESM).

The ESM consisted of the following procedures. Each student was asked to carry for one week an electronic pager and a booklet containing fifty identical response sheets. About eight times a day, at a randomly chosen moment, a signal was sent to all the pagers. When the signal activated the pager, students would take out their response booklet and fill out a page, indicating what they were doing, where they were, and what they were thinking about. In addition, each time they also rated their feelings on thirty scales along a variety of dimensions (e.g., happy-sad, strong-weak, clear-confused). This technique allows precise description and comparisons of the quality of experience.[16]

Besides the ESM several other measures were taken (e.g., personality test, self-concept questionnaire, ability test) and all students were intensively interviewed at the beginning of the study. Before we turn to the results based mainly on the ESM, we want to introduce the reader to some of our students who showed high interest in the arts. The following cases are based on the interviews. The cases we have selected are intended to highlight the relationship between the arts and quality of experience.

CASEY

Casey is a fifteen-year-old girl who has been nominated as being talented in arts. She has already won an art contest. Her self-description shows her as a normal teenager who likes to be with friends, finds school sometimes boring, and has a good sense of humor. Her greatest problem is being "shy around people that I don't really know." Also, she seems to get easily upset and wishes to be better able to control her emotions. Casey wants to get good grades so she can go to a good liberal arts college and become a commercial artist. Since she does not know whether she will be good enough to make a living as an artist, she needs a job that allows her to "do fine art . . . in my spare time."

What makes it meaningful for her to paint or draw pictures? "In art I like being able to feel some way and have someone else feel the same way." For Casey art seems to be a tool to express her own feelings and to communicate them to other people. Moreover, in doing art she seems to be able to gain more control of her emotions. She says: "I'm more interested in emotions than anything else. I'm not interested in logical thinking. I'm not interested in the laws of nature. I'm just interested in surroundings, the way things look, the way I feel, the

way other things feel." But doing art isn't just fun, it also involves becoming more competent and skilled. In fact, Casey regards enjoyment and skill development as being closely related. She not only likes art more than ever but also believes that she has "improved a lot from last year." She thinks that the more she puts into art the more she gets out. Obviously, the reward of becoming more and more competent in the arts is the artistic activity itself (and not the "good life" in the future). It is not surprising then that she states: "No, I never really thought about quitting art. I didn't think it was something that you could actually quit. Once you get started with it you don't just stop."

PAUL

Paul is fifteen years of age and his talent and interest are in art, especially drawing and sketching. Paul does not want to be popular. In stark contrast to most of his peers, Paul likes being alone. The one thing Paul most dislikes about himself is, like Casey, "being shy—mostly with girls." He also believes that he should take school more seriously, because he is not doing as well as he thinks he should.

The expression of emotions is for Paul an important part of drawing. "I normally draw my emotions and feelings," he says. A vivid example of using art as a means to overcome a personal problem or to cope with strong negative feelings is given by his description of what he did over the weekend after his beloved grandmother died. At that time he had to do an assignment: "I was really depressed—and the assignment was to do something strange with a shoe, so I made the shoe shaped like a little boy that hung himself with a shoelace." But art in Paul's life is not solely important during times of personal crises. He generally enjoys doing art and attributes high significance to it: "It gives me freedom, I guess. It makes me more creative. It makes me think more." He feels that his interest in drawing is "the strongest thing I have right now."

As we will see below, the major constituents of optimal experience are the perceptions of high skills and high challenges. When these conditions are present, an experience of "flow" becomes possible. When asked whether he ever experienced doing something where his concentration was very intense, his attention wrapped up in what he was doing, and where he became totally unaware of things around him, Paul named drawing as his foremost flow activity. He indicated that at least once a week drawing helps him experience flow.

KENDALL

Kendall is fourteen years old and has been nominated as a talented musician, a singer. Like many of her peers Kendall expresses confusion about who she really is as a person. Otherwise, she describes herself as being grown-up and "really understanding, really logical."

One of the things Kendall likes about herself is that she is a good singer: "It's not conceited to say, I just am. I've worked really hard at it. . . . I'm pretty much to the point where I can sing almost anything. I just have to work at it." She has already sung in the chorus of "South Pacific." Singing is also her main and most enjoyable activity. Her most ambitious goal for the future is to get a lead part to sing. "Right now, nothing is as important as accomplishing my music, and being able to sing really well." In her case, the desire to be competent and the enjoyment of singing are not contradictory forces. "I've been enjoying myself more than ever in chorus class, because we've been singing really hard music that I really had to train myself hard to sing." Singing is her greatest challenge right now, more important to her than all other things in school. Kendall exhibits a strong need to become competent which is accompanied by a strong sense of self-determination: "It's [singing] the one thing I have that's really mine right now, something other people don't tell me how to do or what to do with it. When other people tell me how to do it, it's like they're taking away the only thing right now that's being independent." Another consequence of being intrinsically motivated is that one becomes less dependent on extrinsic rewards: "I don't like compliments, or comments right after I finish singing. . . . First I like to dwell over it and figure out if I thought it was good or not. Then I don't mind some comment."

As has been true for Casey and Paul, Kendall seeks to have a job that allows her to follow her interest in singing. She has realized that a career as a singer is improbable, "because you can't make it just as a singer." But even with these external obstacles, music will not lose its significance for Kendall: "I really do think that I'll pursue it all the way through my life."

The cases described above have several points in common. First, the talent areas in which Casey, Paul, and Kendall are involved provide a great deal of positive experience. They are not only important in the context of school but own a central place in the lives of these teenagers. Second, probably as a consequence of the positive

experience, all three students exhibit high levels of intrinsic motivation to learn. Obviously, they want to learn to become more and more skilled in their craft and to experience the enjoyment that acting on a high skill level provides. They are not primarily motivated by getting good grades, by praise, or by the goal to be better than others. The needs for self-determination and competence are essential aspects of their behavior. According to Deci and Ryan, these needs are the basis of every intrinsically motivated activity.[17] Third, enjoyment of the activity and hard work or effort do not exclude each other. Rather, the two go hand in hand and the one seems not to be conceivable without the other. On the one hand, the liking for art motivates the acquisition of skill and knowledge, and, on the other hand, the mastery of new challenges facilitates interest and enjoyment. Fourth, as we have argued above, artistic activities function as a means to express and communicate emotions, which is particularly important during adolescence when emotions swing between extremes and can disrupt interaction.[18] Fifth, all three students wish that they could continue being involved in art or music throughout their adult lives. They realize, however, that this is rather difficult and have thus made plans to strive for professions which will allow them to stay on as active artists in their spare time. Finally, despite the fact that Casey, Paul, and Kendall are regarded as being talented, their problems, attitudes, and expectations show that they are pretty much "normal" teenagers. This suggests that their experience might be accessible to almost every student.

Of course, there are some teenagers in our sample who seem to have similarly positive experiences in mathematics or science. But these cases are very rare. The interviews we conducted suggest that for most students engaged in art or music a high level of quality of experience is available. However, this conclusion might be premature and in the next section we will present the results of a more objective and quantitative analysis.

Arts and Quality of Experience: A Systematic Analysis

We report here on comparisons made between the quality of experience of students talented in mathematics and science and those talented in arts and music when these groups were actively engaged in their respective talent area. The analysis is based on data obtained by the Experience Sampling Method.

In this report quality of experience in different talent areas is compared by means of four dimensions of experience: affect, potency, self-esteem, and intrinsic motivation. These dimensions have been measured by means of rating scales. Affect was represented by the scales happy-sad, cheerful-irritable, and sociable-lonely. Potency comprised the scales alert-drowsy, active-passive, strong-weak, and excited-bored. Self-esteem was based on ratings of the following questions: Did you feel good about yourself? Were you satisfied with how you were doing? Were you living up to your own expectations? Intrinsic motivation was measured by the question: Do you wish you had been doing something else?

In order to simplify the presentation of results, we have combined the four talent areas into two subgroups, mathematics and science on the one hand, and art and music on the other hand. It should be noticed that all subsamples are independent. If a student, for example, was nominated in two or more talent areas, he or she was assigned to that group which represented his or her *preferred* talent area. The math/science group consists of twenty-nine students talented in mathematics and fourteen students talented in science. The art/music group is made up of fourteen talented art students and forty-nine talented musicians.

First, the results revealed that across all situations the students' feelings were almost exactly the same regardless of the area of talent.

The comparison of experience between specific talent areas is based on only those reports that were made in response to signals received while the students were engaged in school in their respective talent areas. The responses included were as follows: for mathematics students, responses while in mathematics classes; for science students, while in chemistry and biology classes; for art students, while in art class, the studio, and the art room; and for music students, while in music class, the music room, and during rehearsals with a band or orchestra. The number of completed experience sampling forms for individual students ranged from one to five. On the average, every student filled out two or three forms. All analyses are based on individually aggregated scores. In order to outweigh individual differences in general levels of experience, individual z-scores have been computed.[19] Thus, positive z-scores indicate that quality of experience is above the person's weekly average, while the reverse is true for negative z-scores.

The analysis of talent-related experience reveals clear differences (see Table 1). When doing science and mathematics, the teenagers

gifted in these subjects tended to feel *worse* than they usually felt. Conversely, when teenagers gifted in art or music were involved in their subjects, they felt *better* than their weekly average. The differences are especially marked for self-esteem and intrinsic motivation. The level of intrinsic motivation is not only a significant educational goal in itself; it also facilitates learning processes especially when deeper levels of comprehension are required.[20]

TABLE 1

MEANS ON MEASURES OF QUALITY OF EXPERIENCE WHEN STUDENTS WERE WORKING IN THEIR OWN TALENT AREAS

DIMENSIONS OF EXPERIENCE[a]	MATH/SCIENCE STUDENTS ($n = 43$)	ART/MUSIC STUDENTS ($n = 63$)	t-TEST[b] t	$p <$
Affect	− .05	.28	2.39	.05
Potency	− .06	.26	2.51	.05
Self-esteem	− .21	.21	2.83	.01
Intrinsic motivation	− .21	.19	2.74	.01

[a] All mean values reported are based on individual z-scores.
[b] Two-tailed.

What happens when students who are talented in mathematics or science do art or music, and vice versa? As the following results show, the quality of experience shown in table 1 is reversed. When engaged in art-related activities, the quality of experience for math/science students became at least as positive as their weekly average, as shown by the following group means: affect, $M = .06$; potency, $M = .23$; self-esteem, $M = -.01$; intrinsic motivation, $M = .28$. On the other hand, when arts/music students were doing mathematics or science, they reported a quality of experience consistently lower than their weekly average. However, it is only for "potency" that a statistically significant difference between math/science and art/music students emerges ($t = 2.99$, $p = < .01$). It should also be noted that because not many math/science students were enrolled in arts or music classes there were few of them to respond while in those settings. Despite these restrictions, it seems that subject matter can modify the quality of experience. Interestingly, the results also indicate that even without having an outstanding talent in art or music talented students in mathematics and science can have a positive experience in art and music classes.

The results correspond with our theoretical discussion of the differences between scientific and aesthetic reasoning. The domains of

mathematics and science are characterized by their functional and logical approach, while in the arts thought processes do not follow a formal logic and cannot be regarded as means toward a clearly specified end. Our empirical data confirm that engagement in art activities provides more intrinsic rewards than engagement in mathematics or science.

What might be the reason for these compelling results? It seems as if the sciences are learned because they are useful and of high instrumental value, not primarily because they provide positive experiences. It is true that many expert mathematicians and scientists end up enjoying their craft and derive profound joy and satisfaction from it.[21] But such intrinsic enjoyment of science is relatively rare and usually confined to its most skilled practitioners. As our results suggest, however, for most high school students doing science provides only few immediate rewards. Its practice must be extrinsically motivated (e.g., social recognition, promising career prospects) if it is to be done at all. The arts classes, by comparison, seem to provide intrinsic rewards for both high- and low-skilled students. Even a child a few years old can experience profound joy and satisfaction from scribbling on a piece of paper, or from humming a tune. In fact, the domain of arts and the domain of science seem to possess quite different amounts of inherent rewards for the student.

The explanation given above is, however, quite speculative. There are at least two alternative (but not contradictory) reasons that could explain why the arts provide enjoyment, and the sciences do not. The first possibility is that mathematics and science are taught in ways that deter young people from getting involved in these subject matters. The second possibility has to do with the central position attributed by the educational system to mathematics and science compared to all other school subjects. For some students, the achievement of good grades in mathematics and science seems to be more important than getting good grades in other subject areas. As a consequence, the concern of those students for academic success might override the possible enjoyment of doing mathematics and science.

The Conditions of Optimal Experience

The preceding section suggests that involvement in the arts is more enjoyable than engagement in mathematics and science. It is likely that the differences in experience produced by these domains are at least partly a function of their nature. To be able to give further

support to this assertion it is useful to specify more clearly those factors that contribute to the quality of subjective experience.

Most people, when they are asked to describe what makes them happy, will first think of something easy and relaxing, like watching TV, having a beer with friends, or having sex. But if they have more time to think, they usually come up with experiences of a different kind, experiences that involve meeting an unusual challenge and require a certain level of skill, such as hiking a treacherous mountain, bowling a perfect game, hearing an outstanding concert, or having an exhilarating conversation with a stimulating friend. None of these activities depends on external reinforcement. People get involved in them because of the quality of experience they provide. Therefore, experience functions in these cases as an autotelic (or intrinsic) reward. But what are the characteristics of such optimal experiences that lead people to get involved in activities just for their own sake?

A line of research that bears on this question was started in the early 1970s at the University of Chicago.[22] In numerous studies hundreds of people have been interviewed who pursued intrinsically rewarding activities such as painting, rock climbing, dancing, playing basketball, playing chess, and composing music. It was found that whenever people deeply enjoy what they are doing, they report a rather similar experiential state. This state has been called a *flow experience*, because many of the respondents said that when what they were doing was especially enjoyable it felt like being carried away by a current, like being in flow. Consequently, the theoretical model that describes optimal experiences is known as the flow model.

At the core, the flow model states that the perception of high challenges (or action opportunities) and high skills can lead people to a state of consciousness (flow) in which high levels of control, concentration, unselfconsciousness, and a strong sense of involvement are experienced. This "negentropic" state of consciousness contrasts with an "entropic," confused, or random state of consciousness. Persons in flow are deeply concentrated and feel a merging of action and awareness, their attention is centered on a limited stimulus field, and they may experience a "loss of ego" and feel in control of their actions and the environment. A further crucial component of the flow experience is its autotelic nature. In other words, the person in flow does not strive for goals or rewards beyond the activity at hand. The activity provides its own intrinsic rewards.

There is some evidence that flow is most readily experienced in certain kinds of activity. For example, games and play are considered

to be ideal flow activities. In our view, typical flow activities provide the acting person with clear goals, well-defined rules, and unambiguous feedback on performance. This also explains why many rituals and other religious practices enable people to go off into trance-like states. However, the experience of flow is by no means restricted to games and play. Almost every kind of activity can be structured so as to facilitate the experience of flow.

Research has shown that flow is only possible when a person feels that the opportunities for action in a given situation match his or her ability to master the challenges. The challenge of an activity may be something concrete or physical like the peak of a mountain to be scaled, or it can be something abstract and symbolic, like a set of musical notes to be performed, a story to be read, or a puzzle to be solved. Similarly, the skill may refer either to a physical ability or to the mastery of manipulating symbols. More recent research has shown that balance of skill and challenge alone does not necessarily produce a flow experience. Both the challenges and skills must be relatively high (i.e., above a person's average) before a flow experience becomes possible.[23]

Let us now examine the experience of skills and challenges in the two groups of our study. We found rather strong differences with regard to these dimensions. The results show that there is a considerable discrepancy between the experiences of skill ($M = -.27$) and challenge ($M = .90$) in the math/science group. Contrastingly, skill ($M = .27$) and challenge ($M = .52$) seem to be well balanced in the art/music group. The high challenge ratings in mathematics and science indicate that students experience these subjects as rather difficult. The differences between the math/science and the art/music group with regard to perceived skills and challenges are significant at the .01 level (two-tailed *t*-tests).

The results cannot reveal, however, whether individual students actually experienced similar amounts of skills and challenges at the same time. Therefore, we performed a more direct analysis of varying skill-challenge fits.

Figure 1 depicts a model of different "channels" of experience based on differing degrees of skill and challenge. The center of the figure corresponds to the average intensity of challenges and the average strength of skills as measured by the ESM during the week. A flow experience is expected when both challenges and skills are above average. Thus, the respective quadrant is called the "flow channel." A person is in the "anxiety channel" when challenges are high and skills

are low. When challenges are low and skills are high, the condition is one of boredom. Finally, experience is characterized as apathy when both skills and challenges are below average.

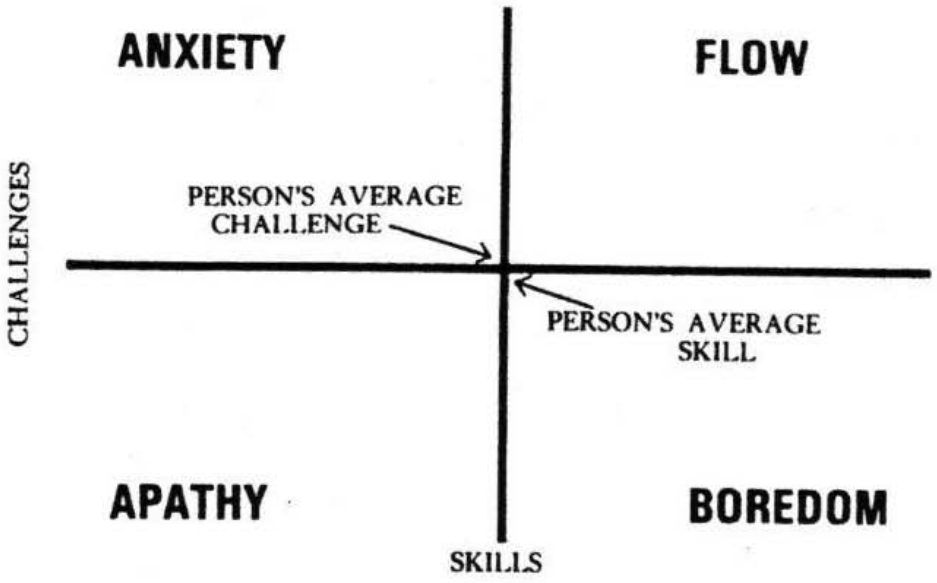

Fig. 1. A model of the quality of experience in terms of the balance of challenges and skills.

For every student we determined the frequency of being in the apathy, boredom, anxiety, and flow channels while engaged in their respective talent areas. Table 2 shows the group means for percentage of time in each of the four channels of experience. The results indicate that when students are engaged in their respective talent areas flow seems to be the most frequent experience for art/music students, while the most frequent experience for math/science students is anxiety. Math/science students are significantly more prone to experience anxiety than are the art/music students, and they are less frequently in the boredom channel than are the art/music students. Art/music students tend to be in the flow channel more frequently than math/science students, but this difference is not significant. The difference between group means with regard to being in the apathy channel is also not significant.

The Representation of Experience in Personality

Our theoretical assumptions suggest that if a student enjoys doing mathematics or music, that student is more likely to cultivate and develop his or her talents in the subject. Indeed, analyses by Csikszentmihalyi et al. and by Wong and Csikszentmihalyi confirm

TABLE 2

GROUP MEANS FOR PERCENTAGE OF TIME IN FOUR CHANNELS OF EXPERIENCE

TALENT AREA	CHANNELS OF EXPERIENCE[a] FLOW	ANXIETY	BOREDOM	APATHY
Math/Science ($n = 43$)	.38	.48	.05	.09
Art/Music ($n = 63$)	.48	.21	.17	.14
t-Test[b]				
t	− 1.25	3.39	− 3.06	− 1.63
$p <$	*ns*	.01	.01	*ns*

[a] Values indicate weighted frequencies.
[b] Two-tailed.

that quality of experience is a valid predictor of engagement in one's area of talent, and of school achievement in general.[24] In order to explain the influence of experiential states on scholastic outcomes, it is useful to assume that people create enduring internal representations of their experiences. Only when a person is able to remember previous interactions with an object or a domain, will experience become a motivator for engaging or not engaging with them in the future.[25] Since students, for example, have rather different experiences in different domains (as we have seen above), the conclusion seems justified that people develop *domain-specific* motivational orientations. Most previous measures designed to tap different motivational orientations[26] are based on the idea that students are either intrinsically or extrinsically motivated, regardless of the content of the task. According to this view, some students just like to learn, whether the subject matter is English or chemistry. In contrast, we believe that a domain-specific concept is more appropriate and has greater power to explain why students are engaged in some subject-matter areas but not in others.

A line of recent research on how motivation affects text comprehension has made extensive use of the concept of interest.[27] Interest implies that people develop specific relationships with different subject areas. The subjective representation of a person-object relationship, as part of the enduring cognitive structure of a person, is called interest. More precisely, interest is defined as a relatively long-term orientation of a person toward an object (e.g., an area of knowledge) or an activity. According to Schiefele, this orientation or relationship is composed of feeling-related (emotional)

and value-related valences that are stored in long-term memory.[28] Feeling-related valences refer, for example, to the association of object-related activities (e.g., solving mathematics problems) with feelings that either precede, accompany, or follow these activities. If personal significance is ascribed to an object or activity, one speaks of a "cognitive" or a value-related valence. In addition to these components, a third important feature of the interest concept is its intrinsic character. This means that interest-based involvement with a certain object is not instrumental for the achievement of goals that are external to that object (e.g., passing an exam) or for receiving any positive rewards.

Although there is not much research on the relation between quality of experience and interest, it seems justifiable on logical grounds to assume that experience affects the strength of interest in a certain domain.[29] The research reported in this chapter indicates that students have a more positive experience when they are involved in art than in mathematics or science. This leaves unanswered, however, the question of whether students also exhibit covarying levels of interest. Fortunately, some relevant data have been gathered as part of the present project. Specifically, students responded to a questionnaire that taps a number of intrinsic and extrinsic reasons for their choice of courses in their respective talent area.

The results are reported in Table 3. They reveal clear-cut and interesting differences between the two domains of talent. First, in both talent domains intrinsic reasons are rated higher than extrinsic reasons. Second, art/music students rated most of the intrinsic reasons significantly higher than math/science students. Third, math/science students rated the three extrinsic reasons having to do with requirements, earning a living, and getting good grades significantly higher than art/music students. This result strongly confirms our hypotheses and the preceding findings.

Some interesting deviations from the general line of results occurred. Art/music students indicated that company of friends and impressing other people are important reasons for them to choose a course. This corresponds with findings from the interviews where art/music students often reported that they enjoy their activities especially when they are with friends or classmates. This is not surprising, especially for music, since most musical activities involve either the presence of listeners or of fellow musicians (e.g., in the school orchestra).

The finding that art/music students put more emphasis on

TABLE 3

MEAN RATINGS FOR IMPORTANCE OF REASONS FOR CHOOSING A COURSE IN ONE'S TALENT AREA

REASONS FOR STUDYING[a]	MATH/SCIENCE STUDENTS ($n = 43$)	ART/MUSIC STUDENTS ($n = 63$)	t-TEST[b] t	$p <$
INTRINSIC REASONS				
I enjoy it.	4.76	5.66	4.49	.001
It's interesting to me.	4.76	5.49	3.15	.01
I get satisfaction from getting better or learning more.	4.76	5.08	1.33	*ns*
EXTRINSIC REASONS				
It's required.	3.10	.93	6.28	.001
It's something that will be useful for earning a living.	4.49	2.49	5.78	.001
My friends do it and I like their company.	1.37	2.53	3.57	.001
It's something I get good grades in.	4.41	3.66	2.07	.05
It's something that impresses other people.	2.71	3.76	3.39	.01
It's a way to get away from my problems.	1.20	3.46	6.92	.001

[a] Range of values: 0 = not at all important for choosing a course; 6 = very important for choosing a course.

[b] Two-tailed.

impressing other people is also quite understandable. It probably reflects the fact that teenage peers are less impressed by a friend who solves an equation with several unknowns than by someone who is able to perform music. Music, of course, is extremely important to adolescents.[30]

Finally, engaging in art and music can be a means to escape from or to cope with one's problems. And, if a student has a problem (for example, with engaging in activities in mathematics and science), experiences in those areas are not likely to be helpful to the student in overcoming other problems.

Consequences for Teaching the Arts

Clifford's comprehensive account of the history of research on teaching the arts reveals some interesting parallels with our discussion of the differences between rational and aesthetic thinking.[31] Her analysis suggests that research on teaching in the arts has been very

rare and was almost without any influence on the practice of teaching.[32] Those art teachers who are very skilled in their domain have been found unresponsive and even resistant "to the general pedagogical currents which press insistently against American public education."[33] Art and music teachers also have often been described as lacking necessary classroom techniques. This might reflect the fact that teachers in arts and music often see themselves as artists rather than teachers. It seems as if the relation between research and teaching in the arts is almost nonexistent, with the exception of some recent developments.[34]

One obvious reason for this state of affairs is that scientific research on teaching processes is based on logic and rationalism, while the subject matters of music and art are different in nature. They do not lend themselves easily to a straightforward and rational analysis. In order to investigate the effect of teaching methods, research has to rely on seemingly objective outcome or criterion measures, such as achievement tests or grades. While this kind of research tends to work for mathematics and science, it creates considerable problems when applied to art or music. Specifically, it has been argued that "artistic production does not lend itself to objective evaluation."[35] It is much easier to agree on the outcomes of teaching in mathematics and science (as well as in languages or history) than to agree on the outcomes of teaching in arts and music. A case in point is the development of musical aptitude tests,[36] which have been criticized as covering only very limited aspects and as being atomistic and mechanistic. In our view, the desired outcomes of art education should include enhancement of subjectively meaningful experience and enhanced creativity and originality. To summarize, the gap between research and teaching in the arts is primarily due to the fact that it seems doubtful whether rational or empirical educational criteria are applicable to the teaching of the arts, which deal primarily with matters of feeling and creativity.

These fundamental differences between scientific and artistic thinking partly explain why art and music teachers might resist looking for help from educational research. It seems obvious that an atomistic and reductionistic approach is far from being helpful to instructors who seek to increase feeling-based, intuitive, and holistic thought processes in their students.

In the following, we want to draw some conclusions about teaching arts from the perspective of our research. Whatever the real accomplishments of students in art and music classes might be, the outcome measure of experience in our study shows that students

generally seem to enjoy these subject areas. Whenever art and music students engage in activities related to their talent, they seem to be in a much more positive experiential state than science and mathematics students. Although we are not able to disentangle precisely the causal conditions for this finding, our study suggests that teaching in arts and music is at least not detrimental to the students' experience.

In recent years there has been an increased effort to put more emphasis on arts education in our schools (e.g., the Getty Center for Education in the Arts).[37] This effort is at least partially based on the concept of discipline-based art education, which means that students are expected to learn about art through four different approaches: art history, aesthetics, art performance, and art criticism. While there are certainly many good points to such initiatives, there is also some danger in such ambitious art programs.[38] The danger is that art education will become more like science and mathematics teaching, and as a result, students will lose their interest in art. A large part of the negative experience associated with science and mathematics is due to their impersonal, instrumental, achievement orientation. There has been much concern about how much students learn in mathematics or science, but not about how much they get to like these subjects. The importance of art and music education rests primarily upon the quality of experience they provide. Thus, any reform to renew the teaching of art and music should be careful to maintain these positive features. To put it in Arnheim's words, "The experience of art . . . must be the beginning and the end of all such [historical, aesthetic, social] explorations."[39]

Art assumes an even greater importance in schools as long as science and mathematics classes are unable to provide a positive experience for many students. To the extent that art classes make it possible for students to have positive experiences in school, they may compensate for the negative feelings experienced in mathematics and science classes.

Educational psychology has relied almost exclusively on cognitive outcome measures. Yet, as has been argued previously,[40] the major obstacles to learning are not primarily cognitive in nature. It is not that students *cannot* learn; the real problem is that they don't *want* to. Moreover, we have seen from the perspective of an evolutionary epistemology how absolutely essential is the education of the emotions, or the prerational intuitions and understandings that lead to creative transformations of knowledge.[41] As a consequence, research on teaching should concentrate on emotional and motivational

variables.[42] When this is done, the importance of the arts for the total educational curriculum will become apparent, instead of being overshadowed, as it is at present, by a naively simplistic reliance on rational-empirical subject matter for the content of instruction.

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