Do People Still Report Dreaming in Black and White? An Attempt to Replicate a Questionnaire from 1942

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ABSTRACT

In the 1940's and 1950's, many people in the United States appear to have thought they dreamed in black and white. For example, Middleton (1942) found 70.7% of college sophomores to report "rarely" or "never" seeing colors in their dreams. I attempted to replicate Middleton's questionnaire and found that students in 2001 reported much more colored dreaming than their earlier counterparts, only 17.7% saying that they "rarely" or "never" see colors in their dreams. Assuming that dreams themselves have not changed over this time period, one or the other (or both) groups of students must be profoundly mistaken about a basic feature of their dream experiences.

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In the 1940's and 1950's, dream researchers commonly thought that dreams were primarily a black-and-white phenomenon (Calef, 1954; de Martino, 1953; Garma, 1961; Hall, 1951; Knapp, 1956; Middleton, 1942; Tapia, Werboff, & Winokur, 1958; for retrospective assessments see Suinn, 1966; Yazmajian, 1968). However, by the 1960's, most researchers were reporting a high incidence of color in dreams (Berger, 1963; Herman, Roffwarg, & Tauber, 1968; Kahn, Dement, Fisher, & Barmack, 1962; Padgham, 1975; Snyder, 1970; Suinn, 1966). Part of this change in opinion may have been the result of a change in methodology: Whereas earlier research was conducted primarily by questionnaire and interview during normal waking hours, later research generally involved either awakening subjects during REM sleep and gathering immediate reports (Berger, 1963; Herman, Roffwarg, & Tauber, 1968; Kahn et al., 1962; Snyder, 1970) or asking subjects to record the incidence of color in their dreams after natural awakening (Gackenbach & Shillig, 1983; Jankowski, Dee, & Cartwright, 1977; Padgham, 1975; Suinn, 1966).

However, it is also possible that this change in psychological opinion mirrored a change in popular opinion about the presence or absence of colors in dreams. Anecdotally, it seems that people now, at least in the United States, tend unreflectively to assume that their dreams are colored, in a way they did not a few decades ago. Color movies, television, and photography were replacing black-and-white media in technologically advanced countries though the 1950's and 1960's, and people may have some tendency to assimilate their dreams to the media of their day.

If popular opinion about the presence of colors in dreams has indeed changed, then we should expect that questionnaires given during normal waking hours will generate very different results now than they did in the 1940's and 1950's. The evidence on this topic is mixed. In 1993, Stepansky et al. (1998) surveyed a representative sample of the Austrian population between the ages of 14 and 69, and still found only a minority (37%) claiming to dream in color (47% said they did not dream in color, while 16% did not answer or said they did not know). On the other hand, in 1999, America On-Line conducted an informal poll which (by the time 40,000 responses had registered) found 56% of respondents claiming to dream in color, 4% claiming to dream in black and white, 27% claiming to dream both in color and in black and white, and 13% saying that they do not know.

The aim of the present study was to attempt a more careful replication of one of the older studies of the incidence of color in dreams to see if the results do indeed differ even when the older methodology is used. The study chosen was Middleton (1942), involving a questionnaire distributed to 277 college sophomores presumably from DePauw University or nearby locations in the United States. Although the original questionnaire is no longer available, it appears to have contained three target questions: (1.) How frequently do you dream? (2.) Do you see colors in your dreams? (3.) Do you experience colored hearing? Each question presented a choice of "very frequently", "frequently", "occasionally", "rarely", or "never". Middleton states that he provided "adequate definitions of terms" and "specific instructions as to the kinds of information that were desired", but he does not say what these definitions or instructions were. He

also provided space for voluntary comments on the questions. A summary of his quantitative results is presented in Table 1.

TABLE 1

from Middleton (1942)	*How frequently do you dream?*	*Do you see colors in your dreams?*	*Do you experience colored hearing?*
Very frequently	13.35%	3.29%	4.86%
Frequently	24.90%	6.95%	6.75%
Occasionally	41.51%	19.04%	20.59%
Rarely	19.85%	30.76%	17.35%
Never	0.30%[1]	39.92%	50.56%

METHOD

Two versions of the questionnaire were administered to separate groups of students. The primary form of the questionnaire (version 1) was given to 124 students (80 women, 44 men) attending introductory psychology and mathematics courses at colleges in southern California. Respondents first answered questions about their sex, age, and years in college, then proceeded to three questions:

(1.) How frequently do you dream?

(2.) Do you see colors in your dreams?

[1] Middleton actually reports 0.03% for this cell, but this is very likely a typographical error.

(3.) Some people say that when they listen to music or hear people talking they simultaneously sense particular colors – for example, someone might have a sensation of green as they listen to a particular piece of music. Do you experience colored hearing?

I added the initial sentence in the third question as an attempt to approximate the definition of colored hearing that Middleton was likely to have given, based on what he says about the phenomenon in his 1942 paper. I did not feel that any other definitions would be helpful. As in Middleton (1942), respondents were given the choice of "very frequently", "frequently", "occasionally", "rarely", and "never", and they were invited to comment on the questions and describe relevant experiences in spaces provided below the questions.

An alternate form of the questionnaire (version 2) was given to 67 students (43 women, 24 men) in a different introductory psychology course on the same day. The three non-demographic questions were:

(1.) When you wake up in the morning, how often do you remember having had a dream?

(2.) Do you dream in color or black and white?

(3.) Some people say that when they listen to music or hear people talking they simultaneously sense particular colors – for example, someone might have a sensation of green as they listen to a particular piece of music. For these people, it is not merely a matter of being <u>reminded</u> of the color; they actually have a sensory experience of it. Do you experience colored hearing of this sort?

The response options were the same, except for the second question, which presented the options of “color”, “black and white”, “both”, “neither”, or “don’t know”.

RESULTS AND DISCUSSION

The data were treated as ranked and nonparametic, and an alpha level of .05 was used for all statistical tests. All Mann-Whitney tests were adjusted for ties, which were numerous. Results for all questions except the color dreaming question in version 2 (which did not have the same response options as the other five questions), are given in Table 2.

TABLE 2

Current Study	*from version 1 of the questionnaire*			*from version 2*	
	How frequently do you dream?	*Do you see colors in your dreams?*	*Do you experience colored hearing?*	*How often do you remember having had a dream?*	*Do you experience colored hearing?*
very frequently	27.4%	26.6%	4.8%	6.0%	3.0%
frequently	33.9%	25.8%	4.0%	30.0%	9.1%
occasionally	25.0%	22.6%	33.9%	41.8%	13.6%
rarely	13.3%	13.3%	21.4%	19.4%	22.0%
never	0.4%	4.4%	32.7%	3.0%	52.3%

The results do not total to 100% in the second and third columns of Table 2 because some students did not respond to these questions. No significant relationships were found between sex or age and any of the target questions, using Mann-Whitney and Spearman's rank correlation tests.

As expected, the median of "frequently" for the color dream question in version 1 differed significantly from the median of "rarely" for the hearing question in version 1 (Mann-Whitney, one-tailed), $\underline{p} < .0001$, implying that subjects felt they saw colors in their dreams more often than they experienced colored hearing. Similar analysis of Middleton's data revealed only a non-significant trend in that direction ($\underline{p} = .1192$; medians "rarely" and "never", respectively) despite his having more than twice as many respondents.

The primary hypothesis of this study was strongly supported. On version 1 of the questionnaire, the median of "frequently" for the color dreaming question in version 1 of the questionnaire differed significantly from the median of "rarely" for the color dreaming question of Middleton's questionnaire (Mann-Whitney, one-tailed), $\underline{p} < .0001$: The undergraduates in the present study reported much more colored dreaming than Middleton's undergraduates in 1942. On version 2 of the questionnaire, 62.1% of the subjects reported dreaming in color, no subjects reported dreaming in black and white, 22.7% reported dreaming both in color and in black and white, none responded "neither", and 15.2% said they didn't know. These results closely match the AOL results and differ greatly from the Stepansky et al. (1998) results, though since the response options were not the same, statistical analysis may not be appropriate. Demographic differences may

partly explain the match between the results of the present survey and the AOL results, and the divergence from the Stepansky et al. results, since the respondents in the present study were likely more similar demographically to 1999 AOL survey respondents than to the 14- to 69-year-old Austrians in 1993 who responded to the Stepansky et al. survey.

The present findings suggest that at least among college students in the United States there has been a pronounced increase since 1942 in the tendency to attribute color to dreams. If it is plausible to suppose that dreams themselves have not changed from black and white to color in the interval, we may conclude that one or another (or both) groups of respondents were profoundly mistaken about a basic feature of their dream experiences.

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