

Scuba Diving for Visual Rehabilitation



Scuba diving and its effect on vision capability for people with visual disabilities. From a case study of one visually impaired diver.



Yoshino Yumiko, *Kochi Woman's University*. Koichi Oda, *Tokyo Women's Christian University*.
 Corresponding author: yumiko-yoshi@nyc.odn.ne.jp <http://yoshino-yumiko.net/>

Photo1
Objective:
 This presentation will examine the process in which a person with low vision becomes motivated and eventually does develop the ability to see small sea creatures. We investigate how scuba diving is useful and effective for visual rehabilitation.

1. The profile of case A



Case A is 60 years old, female, and visually and physically impaired. She is aphakic as a result of an operation for congenital cataract, with a corrected eyesight of 0.2 (left) and 0.05 (right). Her peripheral vision is normal. Physically, her mobility is limited due to both femurs being underdeveloped for an unknown reason. Walking is possible with the assistance of a cane. Case A enrolled in the primary division of a school for the blind in 1956. The education system for students with low vision started around 1964. She received her education as a blind student.

Case A and the guide

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2. Method
 This draft will analyze and examine Case A's personal records, which include a diary and diving log with photographs for 26 years worth of experiences, totaling over 700 dives.

How a visually impaired woman learned to see small sea creatures??

3. Scuba Diving Increasing Case A's Ability to See

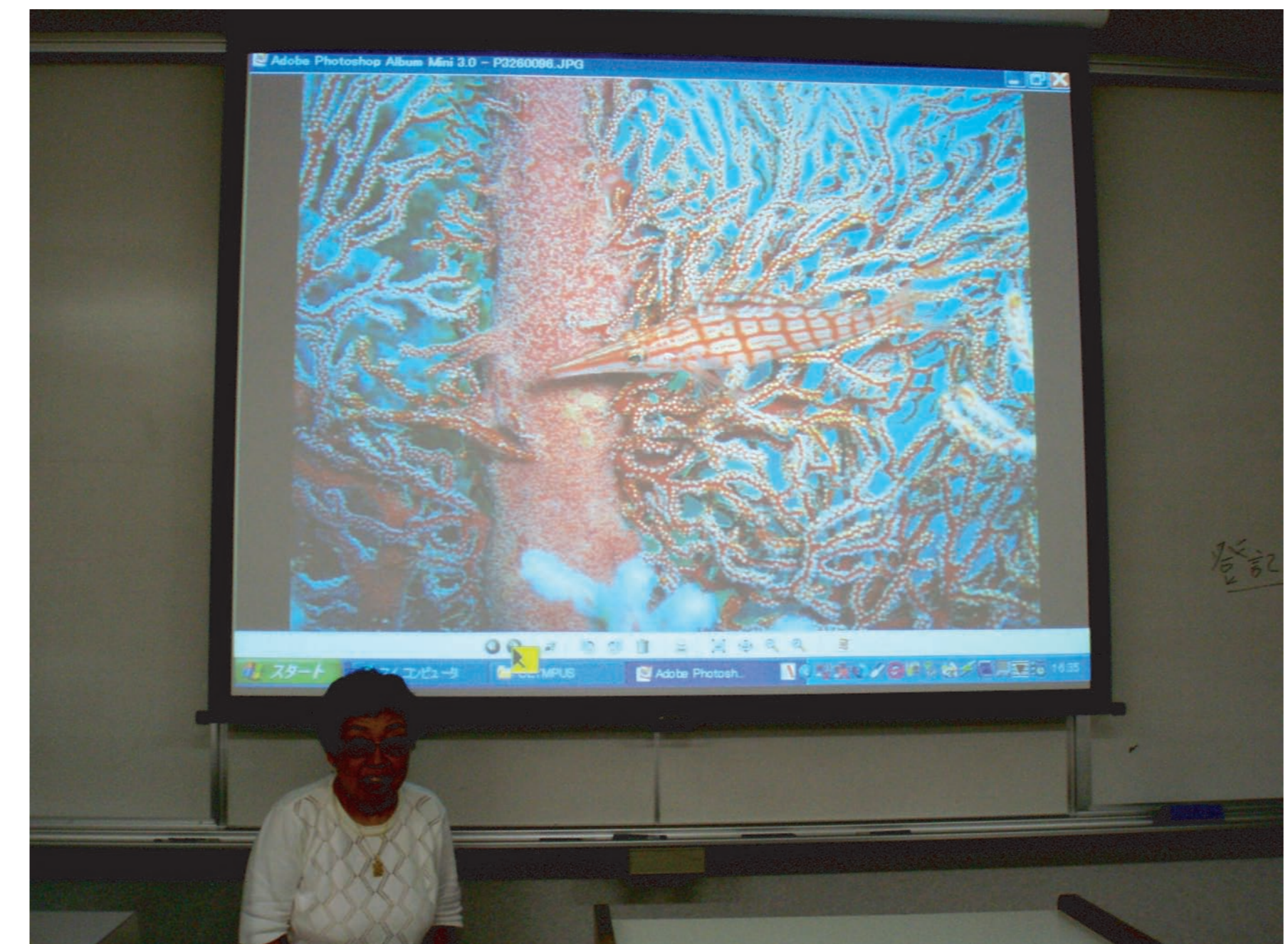
- 1) Underwater, objects appear 1.25 times larger than they do above water and glare is minimized.
 - 2) Motivation to see increases
- It is impossible to communicate verbally underwater. Hand signals or written letters on plates are used by



Photo2

Harlequin shrimps on starfish

- In order to effectively communicate with her fellow divers underwater, she would need to be able to see better.
- 3) The zero-gravity environment allows her to focus on objects she wants to see
 - 4) Increased desire to see what others can see
 - 5) The presence of a diving guide
- The guide that she dove with for over 400 times, knew that



Enlarge image Photo2 with a projector



Took image Photo3 in a PC and spread



The manta which A photographed

though she could not see small sea creatures well. She did however believe that case A might be able to develop her ability to see them over time. The guide would take her to where the sea creatures could be found. And sometimes, she would even put them in Case A's hand, The guide was persistent in showing the beauty of the underwater world to

divers to communicate with each other. Because Case A had only been taught to communicate by listening and feeling, her ability to use her sight was considerably undeveloped.

4. The development of optical instruments, electronic aids, and digital cameras helped Case A increase her ability to see.
- 1) Wearing an underwater mask with lenses for corrected eyesight
- 2) Progress of the diving computer and transmitter
- 3) Rapid progress of digital camera and installation of PC and projector

About Tools

This is A's digital camera which she has been using for the past year. On the left you can see the waterproof case used for underwater photography. Small and compact yet 7 mega pixels



Much like eyeglasses are.

Conclusion:

Once people with vision disabilities experience the pleasure to see interesting things, and develop a strong desire for it, they will attempt to rehabilitate. Steady rehabilitation eventually leads to an increased ability to see. Scuba diving is an effective tool that can be used to motivate people to improve their vision. The expansion of the viewable world will contribute to the improvement of the quality of life for visually impaired people



Photo3

Photo1 This photo of spaghetti eel was taken by A. The contrast in this photo is poor, but the camera has the ability to adjust the focus

Photo2 Two harlequin shrimps resting on starfish. Work of a highly skilled amateur photographer.

Photo3 Picture of sea feather and a longnose hawkfish (scientific name: *Oxycirrhites typus*). Actual size is approximately that of an index finger. Work of a highly skilled amateur photographer