

Alice in Wonderland and cognitive development: teaching with examples

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Alice in Wonderland can be used to give interesting examples of many of the basic concepts of adolescent psychology. Alice's experiences can be seen as symbolic depictions of important aspects of adolescent development, such as initiation, identity formation, and physical, cognitive, moral, and social development. The psychology instructor may choose a part of the story, then point out the parallels between it and particular aspects of adolescent development. This approach enables the instructor to create and maintain a high level of student interest in the course material.

INTRODUCTION

In teaching there is nothing better than a good example. Merely explaining a concept with another concept can be confusing and does not inspire a high level of student interest. Teaching with examples, however, enables the student to approach the concepts with imagination, facilitating understanding of the material and creating a high interest level.

The timeless and captivating story of Alice's journey into Wonderland offers excellent examples for use in teaching the basic concepts of adolescent psychology. Although Alice's age in the story is most likely pre-pubertal (Carroll, 1960b, p. 96), the adventures she experiences can be used as symbolic representations of many of the more important aspects of adolescent development. The story's bizarre characters and strange incidents provide dramatic and humorous illustrations of such topics as adolescent initiation, identity formation, physical development, cognitive development, social and moral development, and even adolescent drug use. What follows is an analysis of the parts of *Alice in Wonderland* which provide good examples of these topics.

ENTERING THE LONG PASSAGE: ADOLESCENT INITIATION

The beginnings of adolescence are marked by initiatory experiences or rites of passage, just as Alice's entry into a new phase of development is represented symbolically by her fall down the long passageway. Her abrupt and inadvertent entry into the passageway corresponds to a young person's sudden entry

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into adolescence at puberty's onset. Alice's unexpected transition from the everyday world of hot summer days and daisy chains to the strange underworld of peculiar creatures and upsetting experiences forces her to adapt, just as the child growing into adolescence must adapt to the new realities of changing biological, social and psychological situations. Alice's fall down the tunnel, though, is only the beginning of a series of initiatory experiences she must undergo.

"WHO ARE YOU"? ASKED THE CATERPILLAR: IDENTITY FORMATION AND PHYSICAL DEVELOPMENT

The *sine qua non* of adolescent development is identity formation. Adolescence is a time for asking questions about who one is and where one is headed in life. Alice's encounter with the Caterpillar shows that she is undergoing the phenomenon which Erikson (1968, pp. 15-19) labelled an "identity crisis".

The Caterpillar, forcing Alice to reflect on her identity, asks her, "Who are you?" Alice replies, "I—I hardly know, Sir, just at present—at least I know who I *was* when I got up this morning, but I think I must have been changed several times since then" (Carroll, 1960a, p. 47). Alice's frequent changes in size have left her feeling confused; she has lost what Erikson (1968, p. 17) would call her "sense of personal sameness". During adolescence, development occurs so rapidly that it is difficult to maintain the sense of personal continuity which a stable identity requires. Many adolescents would give the same type of response that Alice gives to the Caterpillar's question.

The Caterpillar questions Alice, but he also gives her helpful advice: he tells her how to control her size by eating from the correct sides of the mushroom. If she eats from one side, she will become larger; if she eats from the other side, she will become smaller. Of course, when she takes a bite, she usually takes too much, thus becoming either very large or very small, depending on which side she chooses.

Symbolically, increase and decrease in physical size stand for psychological inflation and deflation, respectively. In adulthood, extreme oscillations in mood can be indicative of psychopathology. In adolescence, however, the feelings of being "10 miles high" one day and "about 2 feet tall" the next, are uncomfortable, but normal, phenomena. The Caterpillar's advice could help Alice gain more control of her size; symbolically understood, this could be a lesson in how to avoid the extreme mood swings so common in adolescence. But, even after the Caterpillar's advice, Alice has much difficulty regulating her size; this can symbolize the difficulty adolescents have in learning to regulate their moods.

Adolescents also oscillate between feeling and acting like mature adults and feeling and acting like immature children. Alice's fluctuations in physical size

can be seen as symbolic of the almost hourly variability in adolescents' emotional maturity.

Alice's frequent and drastic size changes can also be used to represent the growth spurt which occurs in adolescent physical development. The growth spurt can result in radical gains in height and weight, with height gains of four inches a year for boys, and three and a half inches a year for girls, not being unusual (McCandless and Coop, 1979, p. 29).

Such rapid acceleration in growth causes changes in body-image, and the latter changes cause changes in self-concept. The final result is an intensification of the identity crisis because the young person has difficulty maintaining a stable sense of self. Alice's changes in size, and her resulting confusion about who she is, are dramatic illustrations of the effects of the growth spurt on adolescent identity formation.

SOMETHING TO THINK ABOUT: COGNITIVE DEVELOPMENT

Perhaps because it reflects Lewis Carroll's own fascination with logic (Carroll, 1960b, p. 13), *Alice in Wonderland* is particularly well-suited for illustrating cognitive development in late childhood and early adolescence. Piaget and Inhelder (1969, p. 130) have described the shift in cognitive development occurring at the end of childhood as a change from thought which is bound to the concrete to thought which is freed from the concrete and open to the abstract. The adolescent who has attained formal operations can see the logical form of an argument and is thus not limited by the argument's particular content. Hypothetical thinking can be performed and the adolescent mind "becomes capable of drawing the necessary conclusions from truths which are merely possible" (Piaget and Inhelder, 1969, p. 132).

This newly-acquired abstract reasoning ability makes logical debate possible and even enjoyable. Adolescents are quick to point out inconsistencies and errors in the logic of an unwary adult's statements. Adults who must deal with this intellectual sword-play may find it annoying, but adolescents need verbal battling as exercise for their new cognitive powers. Through the interplay of argument and counter-argument the adolescent's developing mind sharpens its reasoning.

In the same manner, Alice's mental abilities mature as she encounters each new Wonderland experience. Her dialogues with the creatures are battles of wits that provide opportunity for practice in abstract thinking. The creatures often try to trap Alice with tricky manoeuvres of logic, which, in fact, are rarely logically sound. In her early encounters, Alice is baffled by these tricks, but, as the story progresses, she begins to develop formal operational thinking and is able to fight back with the weapon of abstract reasoning. She attains this reasoning ability, however, only after she has suffered many cruel wounds

from the sarcastic attacks of the Frog Footman, the Cheshire Cat, and the Mad Hatter and the March Hare. Her interactions with these creatures offer fertile examples for teaching the concept of cognitive development, as will be illustrated below.

ALICE AND THE FROG FOOTMAN: AN INTRODUCTORY LESSON IN LOGIC

Early in the story, when Alice comes to the Duchess' house and starts to knock on the door to get in, the Frog Footman, standing outside with her, makes the statement that since he is on the same side of the door as she, there is no sense in her knocking for him to let her in (Carroll, 1960a, p. 57). Although this is a perfectly logical statement, Alice is not interested in a lesson on the finer points of relative position and door-opening by a footman. She is more interested in trying all possible means of rapidly escaping this strange world.

The Frog Footman's statement is a challenge to Alice's naive approach to the world; it forces her to think about logical possibilities as she has not done before. To Alice, this lesson in logic appears to be an obstacle to her immediate goal; it seems as irrelevant to her as geometry seems to some high school students. To adolescents who are seeking immediate goals, and who have difficulty delaying gratification, many things appear to be obstacles. To Alice, the footman's statement is also an apparent obstacle, but, viewed from a different perspective, it can be potentially helpful. The Frog Footman's lesson can be a stimulus to growth, because understanding it requires that she use sequential reasoning, thus encouraging her cognitive development.

A LESSON FROM THE CHESHIRE CAT

In Alice's classic encounter with the clever Cheshire Cat, she is lost and asks the cat which way she should go. The cat aptly replies that the answer depends on where she wants to get to. Alice says she doesn't care, as long as she gets *somewhere*. The cat, correctly and wittily, replies that it doesn't matter, therefore, which way she goes, because she'll be sure to get somewhere (Carroll, 1960a, p. 62).

The cat, in a practical sense, is not being very helpful. But, by replying the way it does, the cat is making Alice aware of her vagueness and is helping her to recognize the greater degree of logical precision she needs to develop.

The Cheshire Cat next introduces Alice to syllogistic reasoning. This part of the story provides an excellent teaching example for illustrating the difference between concrete and formal operational thought. The cat claims that it is made and Alice asks it how it knows this. The following dialogue then ensues.

"To begin with", said the Cat, "a dog's not mad. You grant that"?

"I suppose so", said Alice.

"Well, then", the cat went on, "you see a dog growls when it's angry, and wags its tail when it's pleased. Now *I* growl when I'm pleased, and wag my tail when I'm angry. Therefore I'm mad".

"I call it purring, not growling", said Alice.

"Call it what you like", said the cat (Carroll, 1960a, pp. 63-64).

Alice knows there is definitely something wrong with what the cat has said, but she cannot accurately identify what it is. Put into its syllogistic form, the cat's argument would appear as follows.

Dogs are not mad and dogs wag their tails when pleased.

Cats do not wag their tails when pleased.

Therefore, cats are mad.

That this form of argument is invalid can easily be seen if other propositions are substituted for those used by the cat. (This method of determining the validity of an argument's form has been described by Flew, 1977, p. 24.)

For example, keeping the same form of argument, the following substitutions could be made.

Apples are not blue, and apples have brown seeds.

Lemons do not have brown seeds.

Therefore, lemons are blue.

If Alice had reached the level of cognitive development where analysis of an argument's form is possible, then she could have seen, and perhaps demonstrated, that the Cheshire Cat was using an invalid form of argument. A person who has attained formal operations "is capable of dealing with the form of an argument without regard to its particular content" (Phillips, 1981, p. 163). But Alice, because she is still at the concrete operational level, is bound by the argument's content, and thus cannot deal with the form independent of this content.

THE TEA PARTY: OVER-CONFIDENCE AND IMPULSIVITY

Like the Cheshire Cat, the Mad Hatter and the March Hare lure Alice into games of wits for which she is not yet cognitively prepared. At the Tea Party, feeling unjustifiably self-confident, Alice impulsively engages in the following verbal battle with these two characters.

"Take some more tea", the March Hare said to Alice, very earnestly.

"I've had nothing yet", Alice replied in an offended tone: "so I can't take more".

"You mean you can't take *less*", said the Hatter: "it's very easy to take *more* than nothing".

"Nobody asked *your* opinion", said Alice (Carroll, 1960a, p. 71).

Here Alice becomes the victim of a logical trap, but she steps right into it. Her impulsivity can serve as a good example of adolescent impulsivity in general. All Alice has to say, when asked if she wants more tea, is "Yes, thank you". This simple reply would avoid the trap. But in her moment of irritation she says more than she needs to. Perhaps the beginnings of a sense of logical form, which she had acquired from the Frog Footman's and the Cheshire Cat's lessons, along with an over-confidence in her developing abilities, led her to act impulsively and fall into the trap.

Similarly, adolescents can display over-confidence, which causes them to engage in interactions for which they are unprepared. They are then apt to be wounded by the experience of failure and then retreat from further challenges which they could actually master. A pattern can appear in adolescence in which there is a continual oscillation between conceit, on the one hand, and a complete lack of confidence, on the other.

Though Alice's falling into the trap is painful and humiliating, its positive effects would be to encourage a more thoughtful and cautious approach to life in which one's abilities are realistically matched to one's desired achievements. That Alice has gained a more cautious attitude is shown by an encounter she has with the ugly Duchess.

THE DUCHESS' CONUNDRUM: CAUTION COMES WITH MATURITY

The Duchess makes the following very complicated and puzzling statement.

"Never imagine yourself not to be otherwise than what it might appear to others that what you were or might have been was not otherwise than what you had been would have appeared to them to be otherwise" (Carroll, 1960a, p. 86).

Alice, instead of impulsively blurting out a reply, as she did with the March Hare, simply and honestly admits that she is uncertain about what the Duchess' conundrum means, and that she could understand it better if it were written down. Alice is cautious, showing she has learned to discipline herself. This incident in the story can be used to teach the concept of the ability to defer gratification by restraining one's impulsivity, an ability that can appear in adolescence.

In this encounter with the Duchess, Alice thinks ahead, realizing that the Duchess' statement is an extremely difficult one that would take time to figure out, if it could be figured out at all. Alice is not afraid to admit that she doesn't understand what has been said; she does not need to pretend that she knows

when she does not know. If we consider the proverb that to admit ignorance is the beginning of knowledge, then Alice's admission shows that she may be on the threshold of knowledge. Her subsequent encounter with the King confirms this.

THE KING AND THE TRIAL: FORMAL OPERATIONS ATTAINED

Alice's dealings with the King demonstrate that she has developed greater ego strength and a more logical mind than she possessed when her adventure began. It is rather amazing, considering her recent defeats, that Alice fairly easily outwits the King. Adolescents can experience a rapid change like this in which a new level of insight and confidence is reached. A very satisfying example of Alice's newly-found logical rigor and psychological independence occurs in the following interaction between her and the King, (the King had been looking for a way to make Alice leave the trial of the knave because Alice was challenging the King's method of conducting the trial):

[the King] called out, "Silence"! and read out from his book, "Rule Forty-two. *All persons more than a mile high to leave the court*".

Everybody looked at Alice.

"I'm not a mile high", said Alice.

"You are", said the King.

"Nearly two miles high", said the Queen.

"Well, I shan't go, at any rate", said Alice;

"besides, that's not a regular rule: you invented it just now".

"It's the oldest rule in the book", said the King.

"Then it ought to be Number One", said Alice.

The King turned pale, and shut his notebook hastily (Carroll, 1960a, p. 110).

In this exchange Alice shows that she is mature enough to effectively challenge illogical statements. She does so by spotting a contradiction in the arbitrary and egocentric rules the King makes, and by responding in an assertive and logical manner.

Further into the trial there is an even more impressive demonstration of Alice's developing logic when she attacks the King's attempt to prove through a letter that the Knave stole the tarts (Carroll, 1960a, pp. 110-111). The King states that, since the letter is not in the Knave's handwriting and since the Knave did not sign the letter (an honest man, assumes the King, would have signed it!), then the Knave must have written it, and is therefore guilty of having stolen the tarts.

A child still at concrete operations could have been tricked by this statement; but Alice is clear-headed and demonstrates the proper combination of emotional independence and rationality which is possible in adolescence. She

sees the inadequacy of the King's "evidence", and realizes that there is no logical necessity in his conclusion. Alice has transcended concrete operations and has attained formal operations; she is now able to deal with the form of an argument and is not bound by its particular content, as she was when she dealt with the Cheshire Cat. Her encounter with the King can be used as an impressive example of the development of both logical clarity and self-confidence in adolescence.

CONFRONTING THE QUEEN: ADOLESCENT REACTION TO AUTHORITY

An important reason for adolescent conflict with authority is given by Rice (1975). Referring to Piaget's ideas on the "effects of adolescent thought on personality and behaviour", Rice (1975, p. 370) makes this insightful statement about the formal operational adolescent:

"his ability to distinguish the possible from the real enables him to discern not only what the adult world is, but what it might be like, especially under the most ideal circumstances. This ability of the adolescent to grasp what is, and what might be, is what makes him an idealistic rebel. He compares the possible with the actual, discovers the actual is less than ideal, and becomes a critical observer of things as they are and usually ultracritical of adults as well".

Because adolescents can be especially sensitive to and frustrated by discrepancies between what is and what could be, they may become hostile, blaming parents and other authority figures for not remedying the situation.

There are times, of course, when adult authority is unfair, arbitrary, and pompous. Alice perceives that such is the case with the Queen of Hearts.

In doing verbal battle with the Queen, Alice faces a threatening and outrageously authoritarian mother-figure.

The Queen's idea of proper courtroom procedure, that is, to give a suspected criminal the sentence before the verdict is reached, is the epitome of illogic. The Queen's frequent command of "Off with his head!" is symbolic of her desire to eliminate the intellect. The Queen is thus the enemy of logic and clear thinking, the very qualities which Alice has recently worked so hard to attain. It is no wonder, then, that Alice reacts so strongly to the Queen's conduct by calling out loudly, "Stuff and nonsense!" (Carroll, 1960a, p. 113). Alice thus shows she has gained enough ego strength and cognitive development so that she can define what is correct logical procedure, and can uphold it even in the face of such an intimidating authority figure as the irrational Queen of Hearts. When an adolescent justly confronts unfair adult authority the result may be a strengthening of the adolescent's developing ego. Alice's

confrontation of the Queen can provide a striking example of adolescent confrontation of arbitrary adult authority.

ALICE DEFENDS JUSTICE: MORAL DEVELOPMENT

Alice's behavior at the trial of the Knave also provides an interesting illustration for teaching the concept of moral development. One teaching technique might involve having students read the trial section of the story and then make an evaluation of Alice's stage of moral reasoning using Kohlberg's (1964) categories.

Though her precise stage of moral development can only be inferred, Alice's confrontive behavior toward the King and Queen suggests that she has acquired moral reasoning appropriate for stage 5 on Kohlberg's scale. At stage 5 there is respect for the morality of contract, for individual rights, and for democratically accepted law (Kohlberg, 1964). Alice challenges the King and Queen because they are not upholding these standards of justice. Alice does not merely accept their authority because of their positions, as would a person still in stage 4 ("authority maintains morality"). To Alice, their authority is acceptable only if it is consistent with the underlying moral principle of democratically accepted law. Alice's behavior shows that she has attained a post-conventional moral level.

The fact that post-conventional morality and formal operational thought are developmentally related (McCandless and Boyd, 1979, p. 167), is reflected in Alice's having attained both these levels. Thus, the trial section of the story can also be used to exemplify the correlation between cognitive and moral developmental stages.

MUSHROOMS AND STRANGE CHARACTERS: OTHER CONCEPTS IN ADOLESCENT PSYCHOLOGY

In addition to those concepts discussed above, *Alice in Wonderland* can also be used to illustrate other concepts in Adolescent Psychology. For example, Alice's eating of the mushroom and her drinking from the bottle with the note on it saying "Drink me", can be used as a starting point for a discussion of adolescent attitudes and behavior regarding drugs and alcohol. One apparent goal of adolescent drug use is the altered state of consciousness which drugs can produce. But do adolescents seek altered states out of rebellion, out of a lack of religious meaning in their lives, or because of a desire to escape the painful feelings involved in growing up? These and other related questions can be pursued using Alice's "trip" as an example.

Alice's humorous, and often frustrating, interactions with the weird characters in the story also provide a rich source for discussion of adolescent social development. She learns how to interact with a variety of personalities,

and, although she has no actual peers in the story, Alice's interactions with the characters demand abilities which are essential for good peer relationships. Having successful peer relations involves co-operation, but it also involves not being swayed by peer pressure when the group consensus conflicts with one's own essential individuality. Alice learns to make up her own mind and to develop her own independent point of view even when she is pressured to conform. Her struggles dramatically depict the dilemma in which adolescents find themselves as they simultaneously attempt to have good peer relations while respecting their own developing individuality.

Sexual development, a topic of crucial importance in adolescent psychology, is unfortunately, not well-illustrated in *Alice in Wonderland*. The repressive mid-19th century English society may have prevented Carroll from incorporating sexual motifs into his story, plus the fact that it was first told to three little girls (Carroll, 1960b, p. 21); or perhaps Carroll's own sexless life (Carroll, 1960b, pp. 10, 13) is the reason sexual themes are not apparent. Of course, a psychoanalytic analysis of the story could reveal sexual symbolism, probably in incidents such as the descent down the tunnel. But for presenting a thorough and contemporary discussion of adolescent sexual development, the psychology instructor should probably look elsewhere for examples.

CONCLUSION

Alice's adventures in Wonderland end when she awakens from her dream. The dream represents the unconsciousness of the pre-adolescent state of mind. The fact that Alice awakens from her dream shows that she has successfully completed her initiation and is now able to re-enter the everyday world. But she re-enters as a new person with new skills and strengths. Alice's newly-acquired cognitive, moral, and ego development enable her to rise out of the unconscious dream state and to enter a sharper, more focused consciousness. Her emergence from the dream parallels a person's emergence from the foggy semi-consciousness of pre-adolescence into the sunlit clarity of adolescent consciousness where a sense of ego control exists.

It is because *Alice in Wonderland* is a tale of initiation and development that it provides a natural springboard from which to teach many of the basic concepts of adolescent psychology. The instructor can start with an incident from the story, interpret its symbolism, and then show how the incident illustrates a particular concept. I have found this technique to be a valuable way of capturing student interest and of increasing my own interest in the familiar course material. Since this teaching technique involves creative integration of story, fact, and concept, students and professor alike have the opportunity to use synthetic as well as analytic modes of thinking in approaching the subject matter of the course.

STUDENT QUESTIONNAIRE

Following the part of an adolescent psychology course in which I used *Alice in Wonderland* to illustrate cognitive development, I conducted a survey of student attitudes regarding this teaching technique ($N = 28$). The results of this survey gave evidence that a high percentage of students (87.5%) favored the use of *Alice in Wonderland* to help them learn about cognitive development in adolescence. Student opinion was nearly evenly-divided on the question of whether the use of *Alice in Wonderland* caused an interest in learning more about cognitive development than was required for this course.

Overall, these results suggest that the use of this story in the manner described in this article can be helpful to students learning about cognitive development in adolescence. Though questions were not asked regarding topics other than cognitive development, it is expected that the results for these topics would be similar.

REFERENCES

- Carroll, L. (1960a). *Alice in Wonderland*. New York: New American Library.
- Carroll, L. (1960b). *The Annotated Alice* (Introduction and Notes by Martin Gardner). New York: New American Library.
- Erikson, E. H. (1968). *Identity: Youth and Crisis*. New York: W. W. Norton.
- Flew, A. (1977). *Thinking Straight*. Buffalo, NY: Prometheus Books.
- Kohlberg, L. (1964). Development of moral character and moral ideology. In *Review of Child Development Research*, Hoffman, M. L. and Hoffman, L. W. (Eds), Vol. 1. New York: Russell Sage Foundation.
- McCandless, B. R. and Coop, R. H. (1979). *Adolescents: Behavior and Development*. New York: Holt, Rinehart and Winston.
- Phillips, J. L. (1981). *Piaget's Theory: A Primer*. San Francisco, CA: W. H. Freeman.
- Piaget, J. and Inhelder, B. (1969). *The Psychology of the Child*. New York: Basic Books.
- Rice, F. P. (1975). *The Adolescent: Development, Relationships and Culture*. Boston: Allyn and Bacon.