Supplementary materials

Appendix A

Examples of pictures used in tasks. Panel A: Sticker Task – farm picture. Panel B: Choose a Door Task

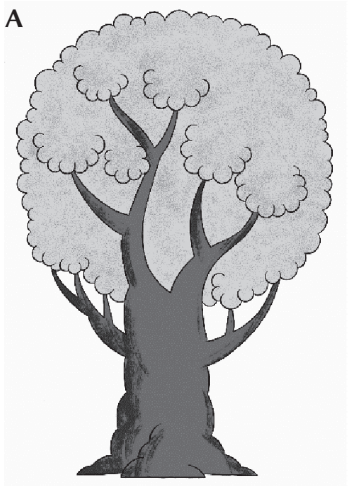
A

B

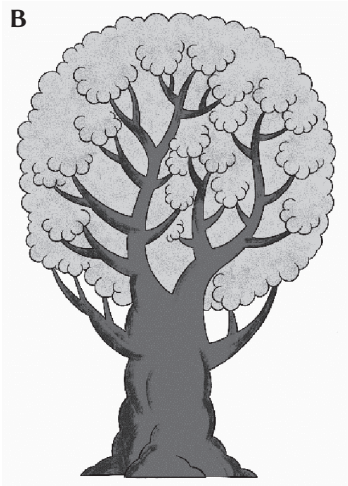
Appendix B

Pictures used in the Puzzle Difficulty Task

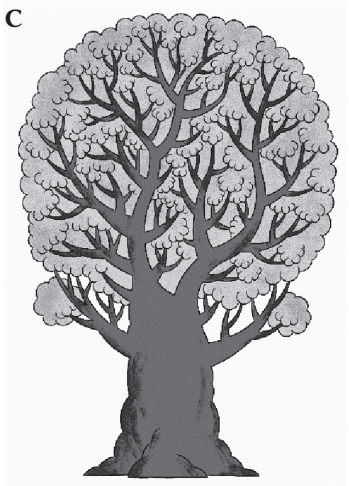
A



B

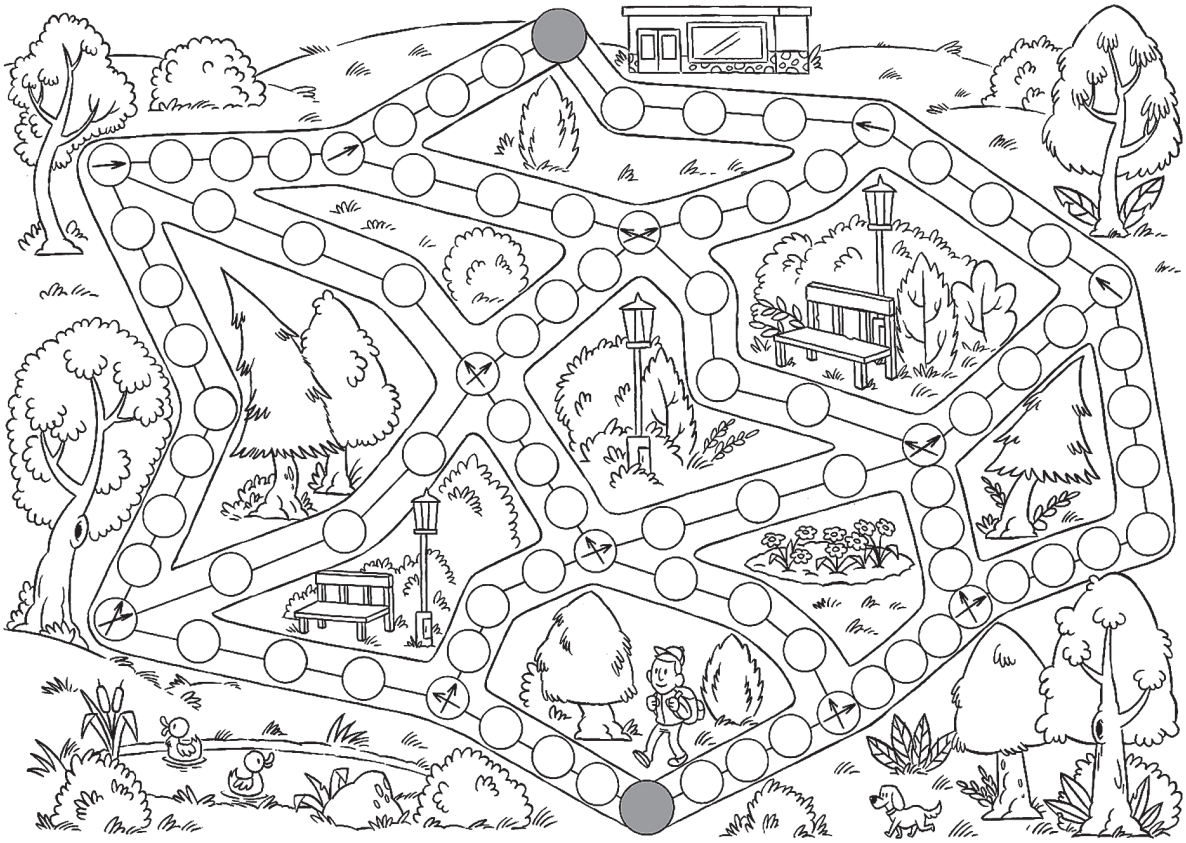


C



Appendix C

Picture used in the Maze Task



Appendix D

DETAILED DESCRIPTION OF THE MEASURES USED IN THE STUDY AND THE PROCEDURE

The Dice-Hole Task (DHT) is based on a description in Zigler and Balla (1972) of a task called "Marble in the Hole", which was designed to measure responsiveness to social reinforcement. The original task comprised a box with holes and some marbles that a participant put in the correct holes in the presence of an experimenter. In this task, the indicator of a positive-reaction tendency was the overall time that a participant played the game; the indicator of a negative-reaction tendency was the difference between the time played in the first and second parts of the game. The task designed for our pilot study comprised a cardboard box with six holes marked with six different colors, and a set of 100 dice marked with colors which corresponded to the holes on the box. During the study, we asked participants to put six different dice as quickly as possible in the correct holes in two trials. As an indicator of negative-reaction tendency, we used the number of times the participant put six dice in the box during the first trial, when the experimenter did not give feedback that would reinforce the performance. As an indicator of positive-reaction tendency, we used the difference between the number of times the participant put six dice in the box in the second trial (in which the experimenter gave supportive feedback to the participant) and the first trial (ΔDHT).

Sticker Task (ST) is a measure based on a description in Yando and Zigler (1971) of a task called "the Sticker Game", which was designed to measure outerdirectedness. In the original task, participants were presented with a set of stickers and designs prepared by the experimenter. Participants could imitate the original designs or create their own. Outerdirectedness was indicated by a tendency to imitate given designs. In our study, we prepared three pictures and sets of stickers that were suitable for each picture. The first picture presented a farm (see Appendix A); the second picture presented five black-and-white objects, such as a t-shirt or a baseball cap; the third picture presented five abstract paintings. Each picture had marked spots where the stickers could be placed. Each time a picture was presented to a par-

ticipant, the experimenter presented her own picture and placed stickers in places of her own choosing, but these places had actually been assigned before the study. Then, the participant had to place stickers on an identical picture while the experimenter's picture was still on the table. On the first picture, the experimenter placed farm animals; on the second picture, the experimenter placed colors that best suited the objects in his opinion; on the third picture, the experimenter marked from 1 to 5 paintings in terms of their attractiveness. The indicator of outer-directedness in our study was the number of times the tested person placed stickers in the same way as the experimenter.

Puzzle Difficulty Task (PDT) is a measure that assesses a preference for challenging tasks related to effectance motivation; it is based on a description in Harter and Zigler (1974) of a task called "Puzzle Preference". In the original task, participants were presented with three sets of puzzles that required completion. The difficulty of these puzzles differed. Effectance motivation was indicated by the level of difficulty chosen by participants. In our task, we created four sets of puzzles. Three of them comprised 12 elements, and the last one comprised 16 elements. Each picture on the puzzles depicted a tree whose number of branches varied (see Appendix B). After finishing the first set of puzzles, the participant could choose to do the same set of puzzles again or try to finish an unknown and more difficult puzzle. The subjects were asked three times whether they wanted to do the same set of puzzles again or do a more difficult one. Effectance motivation was indicated by the number of times a participant decided to choose a more difficult set of puzzles.

The Maze Task (MT) is a measure that assesses variation seeking, which is indicative of effectance motivation; it is based on a description in Harter and Zigler (1974) of a task called "Box Maze". In the original task, participants were presented with a maze which had several alternative correct paths but the goal was always reached in 10 segments, no matter which path was chosen. Participants were asked to complete the maze five times, and the score, which indicated effectance motivation, was calculated based on the difference between the path taken in two consecutive trials. Our task consisted of solving a maze presented on an A4 piece of paper. The labyrinth had several correct paths and was designed such that each time it potentially required 23 different steps to reach the goal (see Appendix C). The score in our study was the number of segments in the second attempt that were different from the segments chosen in the first attempt.

Choose-a-Door Task (CDT) is a measure that assesses curiosity, which is indicative of effectance motivation; it is based on a description in Harter and Zigler (1974) of a task called "Pictorial Curiosity". In the original task, participants were presented with a cardboard house which had two separate doors. On one door there was a picture identical to a picture hidden behind the door; the other door was blank and behind it was a novel picture. The score in this task was calculated based on the percentage of times the participant chose to look at the novel picture. In our task, we prepared 10 pictures of houses, each of which had two front doors (see Appendix A for an example). As in the original task, on one door there was a picture indicating what kind of object was behind the door, and on the other door was a blank spot. The score in this task was the number of times the participant chose to look at the novel picture.

Pegs and Pucks Task (PPT) assesses mastery for the sake of competence, which is indicative of effectance motivation; it is based on a description in Harter and Zigler (1974) of a task called "Graduated Pegs". In the original task, participants were presented with a wooden block and a set of pegs which could be arranged according to a specific rule. Effectance motivation was indicated by applying a systematic solution to the task when no clear instruction on how to perform it was presented. Our task consisted of three trials. First, participants were presented with a wooden block and pegs designed in a similar way to those in the original study. The pegs could be placed randomly or systematically in the holes in the board such that their height matched the depth of the holes. Next, participants were presented with a wooden stick and a set of pucks of different widths which could be placed on the stick. Finally, participants were presented with two sticks and two sets of pucks. Effectance motivation in each trial was indicated by systematic arrangement of pegs and pucks without instruction from the experimenter on how to perform in this task.

Probability Risk Task (PRT) is a task based on descriptions of a decision-making task that assesses expectancy of success (Bennett-Gates & Kreitler, 1999). In our study, we prepared a computer task in which participants were told that they needed to obtain a certain amount of virtual money by taking part in an internet auction and selling different items. Each time, participants could make a safe choice and obtain a fixed and average amount of virtual money, or they could make a risky choice which could lead to obtaining a smaller or bigger amount of virtual money than in the safe condition. The indicator of lowered expectancy of success in this task was the number of safe choices made by a participant.

PROCEDURE

The head researcher contacted school boards and obtained approval to conduct the study. The participants and their parents were given detailed in-

structions on the procedure. The participants were informed that they could withdraw from the study at any time without any consequences. Each participant was tested individually at school in a specially prepared room by a psychology student.

The tasks were presented in the following order: Dice Hole Task (first trial), Sticker Task, Puzzle Difficulty Task, Maze Task, Choose-a-Door Task, Dice Hole Task (second trial), Pegs and Pucks Task, and Probability Risk Task. In the first trial in the Dice Hole Task, participants were instructed to put sets of colored dice in corresponding holes while the experimenter recorded the time. Participants were told that they could repeat the task several times in order to try to improve their time. During this task, the experimenter was instructed to avoid eye contact with students and to not encourage them to continue the task. According to Zigler's theory, a situation in which task performance is not reinforced with positive feedback should invoke a negative-reaction tendency in the form of willingness to finish the task quickly. After completion of this task, the experimenter made eye contact with the participant and behaved supportively throughout the rest of the study. Next, in the Sticker Task, the experimenter presented cards with empty spaces and stickers. The experimenter then placed stickers on her own cards and said that this was the best way to place the stickers in her opinion. The experimenter's cards were left on the table while the participant placed stickers on their own cards. Next, in the Puzzle Difficulty Task, students were presented with a set of puzzles which they were supposed to put together while experimenters recorded the time. When the participant had finished, the experimenter asked them whether they wanted to put together another more difficult set of puzzles or the same set that they had just finished. The experimenter asked this question three times during this task. Next, in the Maze Task, students were told to quickly mark the shortest road to the goal on a map. After the first attempt, the participant was told how many segments their character had taken to achieve the goal; then, they were asked to mark a route again on another map. Next, in the Choose-a-Door Task, the experimenter explained that each time the participant would see a house which had two doors. Behind the door with a picture, there would be the same object as presented in the picture; behind the blank door there would be an unknown object. Participants were told that they could choose whichever door they wanted. Next, participants were tested again with the Dice Hole Task, but this time the experimenter gave them positive complementary feedback after each successful trial. The difference in performance between this trial and the first attempt at the task was an indicator of positive-reaction tendency. Next, in the Pugs and Pecks Task, the participant was told to put pegs in a wooden board and also put pucks on a wooden stick. The experimenter did not give suggestions on how the pegs and pucks should be placed. Finally, the participant was asked to complete the Probability Risk Task on a computer. The instruction for this task was presented on the screen and read by the experimenter. The participant was asked to play a game in which they had to sell different items and earn a certain amount of virtual money.

Appendix E

Correlations between measured variables for each of the groups

Table E1

Correlations between measured variables for the SVS group. The upper triangle presents Pearson correlations. The lower triangle presents p values

	DHT	ΔDHT	ST	PDT	MT	CDT	PPT	PRT
DHT		−.02	−.03	−.09	−.24	−.34	.17	0
ΔDHT	.933		−.14	−.19	−.06	.15	.04	−.22
ST	.878	.511		.21	−.07	.33	.15	−.16
PDT	.658	.369	.318		−.04	.10	.04	.29
MT	.239	.763	.742	.845		−.04	−.25	.50
CDT	.099	.484	.104	.632	.857		−.10	.11
PPT	.423	.841	.487	.855	.227	.641		−.15
PRT	.997	.282	.448	.155	.011*	.588	.462	

Note. DHT – Dice-Hole Task, ΔDHT – difference between trials in Dice-Hole Task, ST – Sticker Task, PDT – Puzzle Difficulty Task, MT – Maze Task, CDT – Choose-a-Door Task, PPT – Pegs and Pucks Task, PRT – Probability Risk Task, *$p < .05$.

Table E2

Correlations between measured variables for the PSS group. The upper triangle presents Pearson correlations. The lower triangle presents p values

	DHT	ΔDHT	ST	PDT	MT	CDT	PPT	PRT
DHT		−.13	.29	−.05	−.12	.07	.37	−.34
ΔDHT	.535		.11	−.16	−.33	.04	.10	−.23
ST	.154	.602		.19	−.08	.38	.55	−.11
PDT	.818	.433	.363		−.02	.34	.03	.03
MT	.559	.105	.697	.934		−.15	−.04	.31
CDT	.732	.846	.064	.101	.486		.34	−.26
PPT	.072	.624	.004**	.899	.853	.101		−.30
PRT	.099	.258	.600	.872	.129	.218	.151	

Note. DHT – Dice-Hole Task, ΔDHT – difference between trials in Dice-Hole Task, ST – Sticker Task, PDT – Puzzle Difficulty Task, MT – Maze Task, CDT – Choose-a-Door Task, PPT – Pegs and Pucks Task, PRT – Probability Risk Task. $^{**}p < .01$.

Table E3

Correlations between measured variables for the MVS group. The upper triangle presents Pearson correlations. The lower triangle presents p values

	DHT	ΔDHT	ST	PDT	MT	CDT	PPT	PRT
DHT		−.58	−.27	.26	−.02	.08	−.03	−.19
ΔDHT	.002**		.17	−.50	.10	−.09	−.04	.10
ST	.188	.419		.03	−.08	.28	.19	.48
PDT	.203	.011*	.902		−.25	.33	−.38	−.28
MT	.910	.618	.703	.238		−.22	.18	.08
CDT	.713	.663	.169	.105	.291		−.10	.24
PPT	.898	.852	.354	.063	.383	.643		.19
PRT	.371	.634	.016*	.176	.692	.246	.352	

Note. DHT – Dice-Hole Task, ΔDHT – difference between trials in Dice-Hole Task, ST – Sticker Task, PDT – Puzzle Difficulty Task, MT – Maze Task, CDT – Choose-a-Door Task, PPT – Pegs and Pucks Task, PRT – Probability Risk Task. $^{*}p < .05$, $^{**}p < .01$.