Supplemental Materials

PAS task structure

The PAS task was structured in 12 rounds (6 containing uncontrollable obstacles, 6 containing controllable obstacles). The objective in each round was to reach the points at the end of one of the three paths before the round ended (after a certain number of chances that varied between rounds and was unknown to participants). On a selected path, participants either encountered an obstacle cue or a progress cue. The likelihood of encountering obstacles and progress cues did not depend on the path that a participant selected. Participants encountered a total of 40 obstacles and 16 progress cues, evenly distributed between the uncontrollable and controllable conditions. The order of obstacles and progress cues as well as the occurrence of avoided and realized setbacks was pseudorandomly predetermined such that participants experienced the same pattern of events across uncontrollable and controllable setback rounds. When an obstacle was encountered, participants avoided setbacks 40% of the time in each condition. These outcomes were structured so that participants eventually reach the points at the end of a path on 10 out of 12 rounds, equally distributed in the uncontrollable and controllable setback conditions. The length of the rounds was equal across conditions and set such that participants experienced 0 (2 rounds), 2 (6 rounds), or 3 setbacks (4 rounds). Following the choice of a path, the response to an obstacle cue, and the presentation of a setback (avoided/realized), a blank screen with a fixation dot at the center was presented for 4s or 6s. This variable time between events allowed us to record SCRs to the setback events that were uncontaminated by responses to prior or subsequent events.

Instructions to participants in the PAS task

Participants read the following instructions for the PAS task on a computer screen, instructions were accompanied by pictures showing events in the task:

"In this game, you are a student trying to earn a degree. You'll choose a course of study, then try to progress toward your degree. You'll play several rounds of the game. Each degree you earn will add to your total points. Try to get as many points as you can.

"You start by choosing a program of study. Each of the choices (A, B, or C) leads to a degree that has a certain value, which is shown on the right side of the screen. To choose program A, press 1. To choose program B, press 2. To choose program C, press 3. Try it out on the next screen. {Choice Screen}.

"After you choose a program of study, you'll get chances to progress towards your degree. You can make progress in three ways: 1) by going to class, 2) by passing exams, 3) by getting past course cancellations.

"1) Going to class (green triangles). When you see a green triangle, it means you can make progress by going to class. Press a key to go class when you see a green triangle. It doesn't matter which key you press, any of the 1, 2, 3, or 4 keys will work. Try it on the next screen. {Class meeting Screen} As long as you press a key when you see a green triangle, you will always make progress.

"2) Passing exams (orange triangles). Orange triangles mean you have an exam. When you see an orange triangle, you need to press the correct key to pass the exam and make progress. You have to use trial and error to figure out the correct key to pass exams. Once you figure out the correct key, you can use the same key to pass every exam until a new round starts. Try it now on the next screen. Just press the 1, 2, 3, or 4 key to try to pass the exam. {Exam Screen, Positive

Outcome Screen} You won't always pass on your first try. You'll need to try different keys to figure out which one works. When you don't press the correct key, you fail the exam and lose the progress you made in the program. On the next screen, you'll see what happens if you press the wrong key. {Negative Outcome Screen} As you just saw, you lose your progress if you fail an exam. When you lose your progress you go back to the starting point and choose a program of study again. Again, to pass exams (orange triangles) you have to figure out the correct key. Once you find the correct key, you can use it to pass exams for the rest of the round on any degree path.

"3) Course cancellations (purple triangles). Purple triangles signify that the school is cancelling courses in your program. When you see a purple triangle, press any key to find out if your course is cancelled. If it's cancelled you lose your progress and have to start over. Even if your course gets cancelled, you can still choose the same program of study on your next turn (there are lots of courses in each program). It doesn't matter what key you press when you see a purple triangle - you don't have any control over course cancellations. But you do need to press a key even though it doesn't matter which one. Try it out on the next screen. First you'll see what happens when your course is cancelled. {Course Cancellations Screen, Negative Outcome Screen}. Now you'll see what happens when your course is not cancelled. {Course Cancellations Screen, Positive Outcome Screen}.

"Here are the things you need to know to play this game:

* First, choose your course of study

* Make progress as you encounter Green, Orange, and Purple triangles

* Green triangles = go to class by pressing ANY key

* Orange triangles = pass exam by pressing the CORRECT key

* Purple triangles = see if course is cancelled by pressing ANY key

More things you need to know to play this game:

*If you fail an exam or your course is cancelled, you start over and get a new chance to choose which degree to pursue (A, B, or C). You can always choose any degree even if you tried it before.

*In a single round you will encounter midterm exams or possible course cancellations, but not both.

*In each round you have limited chances to earn your degree- if you reach the degree in time you get the points- if you don't reach the degree you get no points.

*Degrees that are worth more are not necessarily harder to earn-some high value degrees may be easy to earn and some low value degrees may be difficult to earn."

Analysis of persistence on the highest value path

An alternative account of persistence might be that persistence in the PAS task is the continued pursuit of the optimal (highest value) path despite setbacks. By this definition of persistence, an analysis restricted to trials where participants initially chose the highest value path showed that stressed participants were still less likely to persist through uncontrollable setbacks ($t_{(68)}$ = -2.73, p = .004, one-tailed, d = .645; see table S1) on the highest value path. The groups did not significantly differ in persistence through controllable setbacks on the highest value path ($t_{(68)}$ = -1.27, p = .104, one-tailed, d = .301). Furthermore, the groups did not differ in how often they chose the highest value path before encountering any setbacks (stressed M = 55.83, *95% CI* = [48.65, 62.62]; non-stressed M = 58.75%, *95% CI* = [50.24, 66.67], p > .250, one tailed). Likewise, the groups did not differ in how often they initially chose the middle value path before encountering any setbacks (stressed M = 23.96%, 95% CI = [19.27, 28.87]; non-

stressed M = 24.38%, 95% CI = [19.14, 29.73], p > .250), or the low value path (stressed M =

20.20%, 95% CI = [15.72, 25.22]; non-stressed M = 16.88%, 95% CI = [12.60, 21.53], p > .250).

These results demonstrate that preexisting stress not only decreased the likelihood of persisting

on any path after an uncontrollable setback, it also decreased the likelihood of persisting on the

optimal path after an uncontrollable setback.

Table S1. Behavior (mean, [95% CI]) on PAS trials where participants initially chose the highest

value path.

	% Persistence through setbacks on highest value path		Number of setbacks before switching to a lower value path	
	Controllable	Uncontrollable	Controllable	Uncontrollable
Non-stressed n = 34	86.42 [78.22, 92.90]	71.63 [61.43, 81.89]	2.94 [2.69, 3.16]	2.50 [2.25, 2.74]
Stressed n = 37	78.20 [66.74, 88.17]	50.54 [40.07, 61.20]	2.70 [2.44, 2.94]	2.05 [1.80, 2.30]

Note: Data from participants was unavailable if they never chose to start on the highest value

path (6 non-stressed, 3 stressed).

Analysis of persistence on the lowest value path

If preexisting stress impairs people's ability to cope with negative emotion from

uncontrollable setbacks and causes them to avoid the path where the setback occurred, then

preexisting stress should decrease persistence on the lowest as well as the highest value path. In

fact, stress group participants chose to persist through uncontrollable setbacks on the low value

path less often than non-stressed participants (stressed M = 19.22%, *95% CI* = [10.62, 29.39];

non-stressed M = 43.36%, *95% CI* = [28.71, 57.87]; $t_{(58)}$ = -2.36, p = .011, one-tailed, d = .665).

Persistence through controllable setbacks on the low value path did not differ between groups

(stressed M = 56.09%, *95% CI* = [42.13, 69.35]; non-stressed M = 50.80%, *95% CI* = [35.56,

66.49]; $t_{(56)}$ = .30, p > .250, one-tailed). One noteworthy point about this analysis is that some

participants never chose to start on the low value path. Thus, these data are from a subset of the

whole sample (uncontrollable setbacks: 32 stress group, 29 non-stress participants; controllable

setbacks: 33 stress group, 26 non-stress participants).

Comparisons between cortisol responders and non-responders

To examine effects of the cortisol response on persistence in the PAS task and preference

for choice, we conducted comparisons between all cortisol responders (n = 24) and non-

responders (n = 54). No significant difference between cortisol responders and non-responders

was evident in persistence behavior in the PAS task (2 (setback controllability) X 2 (cortisol

responder/non-responder) ANOVA main effect of cortisol response: $F_{(1,75)}$ = 2.22, p = .141;

interaction: $F_{(1,75)}$ = .20, p > .250). Furthermore, the preference for choice measure revealed no

significant difference between cortisol responders (M = 68.50%, *95% CI* = [63.39, 73.52]) and

non-responders (M = 66.89%, *95% CI* = [62.83, 71.08]).

Response times for persist and non-persist decisions in the PAS task

We further examine persistence decision response times separately for decisions to

persist with a path versus decisions to switch from a path. A 2 (stress, non-stress) X 2 (persist,

non-persist decision) showed no significant main effects or interaction (all p > .250; stress group

persistence RT: M = 1059ms, *95% CI* = [906, 1212]; stress group non-persistence RT: M =

1053ms, *95% CI* = [905, 1201]; non-stress group persistence RT: M = 976ms, *95% CI* = [837,

1115]; non-stress group non-persistence RT: M = 1074ms, *95% CI* = [844, 1303]).