

Difficulty

1 **7786 words, including abstract and footnotes**

2
3 What is difficulty? Despite being invoked in numerous normative debates, the nature of difficulty remains
4 poorly understood. Various accounts, tailored to different explanatory contexts, have recently been
5 proposed in different philosophical discussions. I criticize these accounts. I then provide an alternative,
6 empirically informed account of difficulty in terms of cognitive demand. This account captures both
7 empirical phenomena and folk intuitions regarding difficulty. I further argue that it generalises well,
8 explaining many other facets of difficulty. I conclude by showcasing the broad applicability of this account
9 by examining a set of normative debates that invoke difficulty. I demonstrate that understanding difficulty
10 in terms of cognitive demand facilitates progress on pressing questions in the study of moral responsibility,
11 achievement, the value of difficult actions, and moral demandingness.

14 **1. Introduction**

15
16 A student ponders a challenging question on a physics exam; an employee, gazing
17 at the morning sun through the window, struggles to find the will to get out of bed;
18 a couple in a rocky relationship tries hard to work out its differences. Difficulty is
19 ubiquitous in many aspects of our lives, and philosophy is no exception.

20
21 Consider three examples of how difficulty is invoked in moral debates.
22 Achievement is commonly understood as the competent performance of difficult
23 tasks and is often claimed to be intrinsically valuable (Bradford, 2015; Kieval,
24 2024). A moral theory may prove overly demanding if its prescriptions are
25 inappropriately difficult (Chappell, 2019; McElwee, 2022). When facing a very
26 difficult task, moral responsibility for errors is reduced, but for failure at an easy
27 task, it is not (Nelkin, 2016; Guerrero, 2017). The critical role difficulty plays in
28 these and other debates makes understanding the nature of difficulty a vital and
29 pressing issue.

30
31 However, the nature of difficulty remains poorly understood. To take just one
32 example, no current theory of difficulty explains the well-studied phenomenon of
33 how difficulty decreases as we learn.

34
35 These problems may stem from the disconnected accounts of difficulty proposed by
36 different philosophers. Conflicting explanations of difficulty, tailored to specific
37 explanatory purposes and contexts, have taken root in various philosophical
38 debates (e.g., Bradford, 2015; von Kriegstein, 2019; Chappell, 2019; McElwee,
39 2022; Massin, 2024; Kieval, 2024; Dunkle, 2024). I present an alternative: a
40 comprehensive theory of difficulty that is intuitively plausible, empirically sound,
41 and broadly applicable across different philosophical debates.

42
43 The remainder of this essay is laid out as follows. Part 2 illustrates the need for a
44 new account of difficulty by identifying shortcomings in current accounts. Part 3
45 develops an alternative, broad-scoped account of difficulty. I argue that difficulty
46 is proportional to ‘cognitive demand,’ the appropriate amount of one’s higher-order
47 processing capacity required by a task. Part 4 introduces the empirical literature on
48 learning and demonstrates that only my cognitive demand account explains how
49 difficulty is reduced as we learn. Part 5 clarifies the relational and context-
50 sensitive nature of difficulty, which is captured by my account. Part 6 argues that
51 my account generalises to a wide variety of cases, including physical difficulty.
52 Part 7 discusses how my account relates to effort. Part 8 briefly outlines four
53 normative applications of the cognitive demand account, highlighting the

1 fruitfulness of the unified account of difficulty in addressing a wide range of
2 philosophical debates.

3 4 **2. The Need for A New Account Of Difficulty**

5
6 Currently, difficulty is typically explained in terms of reliability or effort.

7
8 Reliability accounts suggest that difficulty is a function of how reliably one can
9 bring about a particular outcome (Westbrook & Braver, 2016; von Kriegstein,
10 2019)¹. After all, many difficult things cannot be achieved reliably, such as hitting
11 a home run. However, as others have noted (Bradford, 2015; Guerrero, 2017), many
12 difficult things can be reliably achieved. Think of carrying heavy groceries or
13 multiplying 1237 times 1923 with a pen and paper. These are more difficult than
14 carrying light groceries or multiplying 12 times 13. But still, a competent adult can
15 reliably succeed at all four tasks. And some tasks we cannot bring about reliably
16 do not seem difficult. Rolling a six in a dice game cannot be done reliably. Yet if
17 you casually roll a die and succeed at throwing a six by sheer luck, it sounds odd
18 to describe your action as difficult, rather than just as unlikely (Bradford 2015).
19 Low reliability seems neither necessary nor sufficient for difficulty.

20
21 Effort views, on the other hand, explain difficulty by the effort-requiring features
22 of a task – the more effort a task requires of the agent, the more difficult the task
23 (Bradford 2015; Nelkin 2016; Chappell 2019). These are currently the dominant
24 views, so I will discuss them in greater detail. They seem intuitively plausible, yet
25 they struggle to explain what effort is.

26
27 Some effort views stay silent on what effort is. Bradford tentatively posits that
28 effort may be explanatorily primitive (2015, p.39). This move may strike many as
29 premature, given the sizable philosophical and psychological literature on the
30 topic. That literature instead suggests that an analysis of effort should be attempted
31 before resorting to primitivism, a possibility that Bradford indeed explicitly
32 welcomes (*ibid.*).

33
34 An analysis of effort may rely on the feeling of effort to identify the difficulty of a
35 task (Wolpe et al., 2023; Bermúdez, 2023). However, the feeling of effort and the
36 difficulty of the associated task can become disconnected.² For example, flow
37 states are states of ‘effortless absorption in a task.’ Yet achieving success is
38 difficult even when in a flow state (Csikszentmihalyi, 2002). Consider a
39 professional video game competition, in which opposing players become so
40 engrossed in the task as to no longer experience a feeling of effort. Succeeding at
41 the competition remains difficult, and some players will necessarily lose. In fact,
42 the difficulty of a task is a good predictor of whether subjects can enter a flow
43 state at all (Kozhenikov et al., 2019). Furthermore, Naccache (2006) presents a
44 case report of a patient with a brain lesion who experiences no mental effort. Self-
45 report, behavioural measures, and physiological tests confirm the lack of any
46 feeling of mental effort. Yet, the patient still faces difficulty when undergoing
47 mental tasks and does not perform better than healthy patients. These cases show
48 that the feeling of effort is not a necessary component of difficulty.

¹ Kriegstein defends a hybrid view that incorporates both reliability and effort. I criticize effort views separately below.

² In these and the following examples, multiple indications of difficulty exist: task success is highly variable, subjects self-report experiencing the task as difficult, and physiological measures indicate emotional and/or physical excitation. A more precise measure of difficulty will be introduced in the next section.

1
2 Effort views can avoid these counterexamples by arguing that making efforts and
3 the feeling of effort are distinct (Bermúdez & Massin, 2023; Shepherd, 2023): only
4 the latter is dissociable from difficulty. This view avoids the counterexamples
5 above, because one may make an effort without it feeling effortful. This raises the
6 question of what it is to make an effort. A promising strategy is to identify the
7 underlying psychological mechanism.

8
9 Chappell (2019) appeals to a scientific explanation of effort to explain difficulty.
10 He takes effort to be best explained in terms of willpower, which in turn is taken to
11 be a depletable resource (“Ego Depletion,” see Baumeister, 2018). Yet, multiple
12 large-scale meta-studies have failed to replicate the results underlying
13 Baumeister’s account of willpower (Carter & McCullough, 2014; Vohs et al.,
14 2021). These scientific developments render Chappell's view on effort empirically
15 questionable. Chappell is right that a scientific analysis of effort is required to
16 explain difficulty in terms of effort. But it seems that the wrong analysis of effort
17 has been chosen.³

18
19 As this brief critical review clarifies, no analysis of difficulty is without problems.
20 Reliability views face counterexamples. Effort views seem intuitive and promising,
21 but struggle to identify the nature of (making an) effort. Another issue may arise
22 because philosophers rarely analyse difficulty on its own terms. Current accounts
23 of difficulty are byproducts of other philosophical pursuits. For example, Bradford
24 (2015) and von Kriegstein (2019) provide elaborate accounts of difficulty, but they
25 are ultimately seeking to explain achievement. Nelkin (2016) addresses difficulty
26 mainly to illuminate its role in moral responsibility, and Chappell (2019) and
27 McElwee (2022) analyse difficulty to explain moral demandingness. Such tailor-
28 made accounts excel at explaining the role difficulty plays in each respective
29 debate. But they struggle to generalise across debates.

32 **3. Difficulty as Cognitive Demand**

33
34 I will now argue that the most plausible and broadly applicable account of
35 difficulty explains difficulty in terms of cognitive demand.

36
37 To understand cognitive demand, we must understand a central distinction between
38 two importantly different kinds of psychological processes. On the one hand, we
39 have automatic processes unfolding in a rapid and inflexible manner. Think of
40 recognising a friend's face or perceiving a car moving towards you, both automatic
41 processes that will unfold regardless of whether you want them to or not.

42
43 Not all processes are like this: some psychological processes are serial and
44 flexible. These involve sequential processes of cognitive control, which enable us
45 to select, monitor, sustain, and regulate our voluntary thoughts and behavior. Think
46 of mentally rotating a shape in your mind, deliberately focusing on a detail in a
47 painting, or carefully picking up a shard of glass, all of which you choose, initiate,
48 and execute. For decades, psychologists have built a robust and convergent body of
49 evidence for this distinction between these two different kinds of psychological
50 processes (Seminal works include Fitts, 1964; Shiffrin & Schneider, 1977;

³ In section 7, I suggest an alternative analysis of effort which would render my proposed view a novel kind of effort view. Chappell’s claims about demandingness do not depend upon the truth of the Ego Depletion literature (2019, p.9). I take my account to strengthen his arguments concerning demandingness, as I explain in section 8.

1 D'esposito et al., 1995; Monsell & Driver, 2000; Buckner et al., 2008; Kahneman,
 2 2011; Diamond, 2013; Raichle, 2015. Buehler 2018 presents an accessible and
 3 philosophically rich review.) Automatic processes are fast but inflexible and
 4 simply happen to us. Processes involving cognitive control are slower but more
 5 flexible and deliberate. These latter processes, also known as executive processes,
 6 are key to understanding difficulty.

7
 8 Cognitive control has received relatively scant attention in philosophy. Far from
 9 what the name may suggest, it is not just aimed at regulating thoughts. Rather, it is
 10 domain-general. It is intimately linked to self-control, attention, action selection,
 11 and goal-directed, flexible behaviour (Wu, 2011; Wu, 2016; Sripada, 2020;
 12 Buehler, 2021; Buehler, 2022). These functions are involved in both mental and
 13 bodily kinds of guidance and action.

14
 15 Cognitive control has a maximal capacity (Halford et al., 1998). Working memory
 16 serves as a natural constraint on the number of cognitive control processes that can
 17 be deployed simultaneously. When the requirements of tasks exceed this maximal
 18 capacity, agents become unable to sustain the tasks (Kurzban et al., 2013). This
 19 capacity is also influenced by circumstantial factors, such as the level of
 20 distraction in your environment or the concurrent tasks you perform (Musslick et
 21 al., 2019; Murray, 2023). Other factors may limit cognitive control capacity, and
 22 identifying such factors is an active research program in psychology. However, the
 23 existence of total (i.e., absolute) and circumstantial (i.e., context-dependent)
 24 limitations is widely accepted, providing a distinction between two kinds of
 25 limitations to cognitive control (cf. Engle, 2002; Musslick et al., 2019).

26
 27 There are differences in the amount of cognitive control capacity required to
 28 succeed at a given task. Some tasks, such as complex maths, require much
 29 capacity. Other tasks, such as simple maths, require less. At the same time, some
 30 agents require more or less of their cognitive control capacity for the same task.
 31 Spelling a word, for example, will require significantly more cognitive control
 32 capacity of a child than an adult. How much cognitive control capacity a task
 33 requires of an agent is thus fixed by facts about the task, facts about the agent, and
 34 facts about their circumstance.

35
 36 I call the relational property that fixes how much cognitive control capacity is
 37 minimally required of an agent to succeed at a task in a given circumstance the
 38 '*cognitive demand*' of a task for an agent, given their circumstance.

39
 40 Note that in the examples above, this cognitive demand goes hand in hand with a
 41 higher or lower difficulty. Reading is more difficult for a child than for an adult.
 42 Complex maths is more difficult than easy maths. This is no coincidence. In fact, I
 43 will spend the remainder of the essay arguing that the difficulty of a task for an
 44 agent is proportional to the cognitive demand of the task for an agent in a
 45 particular circumstance.

46 ***Cognitive Demand View of Difficulty***

47 The difficulty of a task for an agent is proportional to the relative amount of
 48 cognitive control capacity that this agent would have to allocate to
 49 appropriately succeed at the task, given their circumstances.
 50

1 This account⁴ explains difficulty as the demands a task makes on the agent's
 2 capacity for cognitive control. Any agent has, in any given circumstance, a
 3 maximum cognitive control capacity to devote to a task. If a task's cognitive
 4 demand exceeds the agent's cognitive control capacity, the task is impossible for
 5 the agent. If a task poses no cognitive demand, it cannot be difficult. Suppose it
 6 poses a cognitive demand within the agent's capacity. In that case, it is difficult
 7 for the agent in proportion to how much of the agent's cognitive control capacity is
 8 minimally required to succeed.

10 **4. Difficulty and Learning**

11
 12 Here is an obvious observation: as I learn to do a task, it becomes easier for me to
 13 do that task. Contrast this with a worrying observation: no previous theory of
 14 difficulty explains why this is the case.

15
 16 In trying to explain, we may say that the effort a task requires is reduced as we learn,
 17 but why is that so? We may claim that higher reliability is achieved, but why is that
 18 so? Such statements redescribe the phenomenon of learning rather than explaining
 19 why learning decreases difficulty. As it stands, no previous theory of difficulty
 20 explains how learning reduces difficulty. The cognitive demand view does, as a
 21 reduction of cognitive demand is at the core of contemporary theories of learning.

22
 23 We have ample evidence that learning fundamentally consists of changes in the
 24 interplay of automatic and cognitive control processes (Fitts, 1964; Shiffrin &
 25 Schneider, 1977; Wiestler & Diedrichsen, 2013; Diedrichsen & Kornysheva, 2015).
 26 We learn by reducing the number of sequential processes using cognitive control that
 27 are required to solve a task. This is terrific news for the cognitive demand account.
 28 This reduction directly leads to a reduction in cognitive demand, thereby reducing
 29 difficulty, as the cognitive demand view would predict.

30
 31 Learning by practice typically proceeds in stages (Fitts & Posner, 1967; Miyachi et
 32 al., 2002; Dayan & Cohen, 2011; Tenison & Anderson, 2016). When facing a new
 33 task that has not yet been learned, learning proceeds by executive rehearsal (i.e.,
 34 repeatedly solving the task using cognitive control): the agent cannot yet rely on
 35 automatic routines to solve the task. Imagine a child adding numbers by using their
 36 fingers: slow, sequential, flexible behaviour that involves cognitive control
 37 processes. As the task is rehearsed over many iterations, parts of the task can be
 38 solved with automatic processing. The child may be able to remember that one hand
 39 has five fingers. They can then count from five upwards when adding $5 + 3$. Notably,
 40 the task still requires some cognitive control capacity, as automatic (5!) and flexible,
 41 sequential processes (6, 7, 8!) both contribute to the task (Fitts, 1964; Shiffrin &
 42 Schneider, 1977; Hardwick et al., 2019). In the last stage, they rely exclusively on
 43 automatic processing for a solution. For example, asking an adult to perform the
 44 calculation $5+3$ requires no sequential calculation. The result is automatically
 45 retrieved (Wiestler & Diedrichsen, 2013; Hodges & Lohse, 2022). The cognitive
 46 demand required to complete the calculation has been minimised. This stage model
 47 of learning generalises to a wide range of tasks in various domains, including
 48 cognitive, perceptual, and motor tasks.

⁴ I present a view of cognitive control as a unified, general mechanism. Alternative cognitive demand views are plausible and possible. For example, some psychologists prefer to speak of different executive functions rather than a unified mechanism: for them, cognitive demand of different functions might motivate speaking of different kinds of difficulty. Others may distinguish between cognitive demand on different capacities, such as working memory and prospective memory. I thank a reviewer for the suggestion.

1
2 Cognitive demand is also decreased by chunking together aspects of a task that would
3 otherwise require sequential, flexible processing (Gobet et al., 2001). Memorising
4 the number 1801412999 by individual digits is much harder than memorising number
5 “chunks” such as 180 – 1412 – 999. When recalling the number, reporting each chunk
6 instead of each digit requires only a third of the work. Such strategies underpin
7 learning in both the mental and motor domains to reduce the cognitive demand of
8 initiating individual steps of a task. So do other strategies that reduce cognitive
9 demand, such as flexibly deploying attention more selectively (Chase & Simons,
10 1973; see also Du et al., 2022).

11
12 What unites all these different aspects of learning is that they are best characterised
13 as the processes by which agents reduce the cognitive demand of tasks. This point
14 has not gone unnoticed by philosophers. In analysing skill, philosophers routinely
15 explain the lowering of difficulty that comes with learning in terms of the interplay
16 of automatic processes and processes involving cognitive control (Wu, 2016;
17 Shepherd, 2017; Pacherie & Mylopoulos, 2021). My account interfaces well with
18 such analyses of skill.

19
20 The link between cognitive demand and learning poses a significant challenge to any
21 alternative view. Neither unreliability nor effort necessarily increases with cognitive
22 demand. This leaves these theories at odds with an empirically and philosophically
23 robust literature on learning and skill.

24 25 **5. Difficulty and Context**

26
27 ‘Difficulty’ seems context-sensitive. The cognitive demand account captures this.
28 Difficulty is a function of three things: the agent, the circumstances, and an
29 assumed appropriate means of executing the task.

30
31 Varying the agent alters the task's difficulty. It is more difficult for children to
32 solve maths homework than it is for their parents. Varying the circumstances
33 changes difficulty. It is harder to solve maths homework while your phone rings, as
34 the self-control you need to exert to ignore the phone also makes use of cognitive
35 control capacity. Lastly, the choice of means plays a role. Imagine doing maths
36 homework by translating the exercise into binary code, solving it in binary code,
37 and then transferring it back into a decimal system. The extra steps involved
38 increase the cognitive demand of the task. In this way, we see how the agent,
39 circumstances, and means jointly specify what we call ‘difficult’.

40
41 The cognitive demand account stipulates that an appropriate means is required to
42 settle the difficulty of a task. By appropriate means, I refer to the minimally
43 cognitively demanding means available to the agent.

44
45 Appropriate means are important because most tasks allow for multiple ways in
46 which they can be completed, often incurring different cognitive demand. Consider
47 Savitha asking George to pick up a glass of water. This is easy because it has a low
48 cognitive demand. Yet George tries to do so using his feet. This requires the
49 utmost focus and attention. He complains that picking up a glass is too difficult for
50 him. Savitha would regard this as nonsensical – picking up a glass is not difficult
51 for George. George just did it in the wrong way!

52
53 Savitha and George are talking past each other. Under the description of “picking
54 up a glass”, the appropriate means is using your hands, which is easy. It promises

1 success at minimal cognitive demand. Under the description of “picking up a glass
2 with one’s feet”, the task is difficult. Note that the notion of appropriateness is
3 evident here when we vary the case. If George informed Savitha that his arms had
4 been amputated, Savitha would realise that the appropriate (i.e. minimally
5 demanding) way of picking up a glass is with his feet. Now, both could agree that
6 picking up a glass is difficult for George.

7
8 Such differences between agents can also help explain why some tasks are
9 considered ‘difficult’ for some, but impossible for other agents. On the cognitive
10 demand view, there is a distinct point at which a difficult task becomes impossible:
11 namely, when performing it adequately would exceed the agent’s capacity for
12 cognitive control. This capacity may differ between agents: what’s difficult for you
13 may be impossible for a child. Introducing a clear and empirically tractable agent-
14 relative threshold at which difficult tasks cease to be difficult and become
15 impossible is a unique virtue of the cognitive demand account.

16
17 ‘Difficult’, on my account, is relative and gradable. The level of difficulty is
18 proportional to the minimal cognitive demand successfully performing the task
19 would pose to the agent, in their circumstance, using an appropriate means. These
20 features of my account explain the context-sensitivity of difficulty. They also
21 explain how cognitive demand settles the difficulty of a task, given the multiple
22 strategies available to agents, and how this can give rise to productive
23 disagreements about task difficulty, as well as illuminate the difference between
24 difficulty and impossibility. Having clarified the account, I will now show why my
25 account is a general account of difficulty, applicable to the different ‘kinds’ of
26 difficulty we encounter in everyday life.

27 28 **6. Unifying Difficulty**

29
30 Does the cognitive demand account of difficulty generalise to the many kinds of
31 difficulty we encounter in everyday life? Here are some examples: solving a maths
32 problem, proving the incompleteness theorems, counting to five hundred,
33 remembering to pick up groceries for a friend, learning to tango, or lifting a heavy
34 weight. These seem importantly different. Nonetheless, the cognitive demand
35 account can explain why these tasks are typically considered difficult, because
36 cognitive control is domain-general and involved in all of them.

37
38 It may seem there is no apriori reason to believe that all difficulty can be explained
39 by one single account. This has led some philosophers to embrace hybrid accounts
40 of difficulty (Nelkin, 2016; von Kriegstein, 2019). Of course, it would be
41 impossible to prove that the cognitive demand account can explain all kinds of
42 difficulty. But I will now argue that it does indeed explain a wide range of cases.
43 These cases, ranging from weightlifting to remembering to pick up a bottle of
44 brandy, initially seem very disparate. Nonetheless, the cognitive demand account
45 makes sense of them. Difficulty, on this picture, is much more unified than it might
46 initially strike us.

47 48 ***Difficulty Tout-Court***

49 On my account, all difficulty is relative to task, agent and circumstance. But are
50 there not some tasks that are just difficult, tout-court? Think of climbing Mount
51 Everest, or of proving the incompleteness theorems. These examples may strike us
52 as difficult, regardless of who performs these actions or the circumstances in which
53 they are performed (cf. Hirji, 2019; von Kriegstein, 2019; Isserow, 2022). Yet two
54 observations indicate that all difficulty is relative.

1
2 The first observation is that what is considered ‘difficult’ tout-court changes over
3 time. A medieval peasant, not having received literacy training, may felicitously
4 say that reading a simple text is ‘difficult’ tout-court. My great-grandfather may
5 felicitously have said that helping a stranger on another continent is ‘difficult’
6 tout-court. Both tasks are trivially easy nowadays.

7
8 In both cases, whether the task is considered difficult tout-court changed over
9 time. They illustrate once more the context-sensitivity of ‘difficult’. Judgements
10 about difficulty tout-court are implicitly relativised to the “normal” agents or
11 circumstances of their time. An average person in 1100 AD could not read a simple
12 text unless they underwent long training, and an average person in the 19th century
13 found themselves in circumstances that did not allow easy access to faraway
14 countries.

15
16 This leads us to the second observation: For every difficult task, we can imagine an
17 agent for whom the task is easy. Gödel famously claimed that he could simply see
18 the proof for the incompleteness theorems. If we take him at his word, the task
19 would be easy for him. Scaling Mount Everest seems ‘difficult’ tout-court, yet
20 Superman could do so with ease. We may think of these as rare exceptions or
21 complain that these examples require agents of superhuman ability. But that is
22 unimportant: ‘difficulty’ tout-court is supposedly independent of agents. Even a
23 single exception, fictional or not, reveals these statements are implicitly about
24 difficulty for most, or all, existing human beings. That is enough to say they are
25 agent-relative.

26 *Diachronic Difficulty*

27 Another important kind of difficulty is diachronic, i.e., difficulty arising in
28 temporally-extended tasks. Sometimes, a temporally extended task presents unique
29 difficulties: think of the difficulty of sustaining a very boring but simple task, the
30 challenge of remembering to go grocery shopping while going about your workday,
31 or the difficulty of writing a book. Currently, the origin of this difficulty remains
32 unexplained. But thinking about central diachronic tasks in terms of cognitive
33 demand helps us understand why they are difficult.

34
35
36 For example, performing a simple yet boring task for a long time is a relatively
37 well-studied case of diachronic difficulty. Sustaining attention to a boring
38 stimulus, such as a moving clock, is surprisingly difficult (Kurzban, 2013). As time
39 passes, the agent’s boredom in performing the task causes them to waver from the
40 goal and experience the task as less rewarding. The feeling of mental effort
41 typically intensifies as we perform a task with a low expected value over long
42 periods of time. Overcoming this aversive feeling is cognitively demanding, unless
43 external factors help (c.f. Murray & Amaya, 2024). This becomes intuitive when
44 you consider which part of the task feels difficult. The first minute of sustained
45 attention may feel easy to you, but as a half hour passes, you may feel a nigh-
46 unbearable urge to abandon the task and check your phone (Kurzban, 2016).
47 Powering through this urge requires self-control, imposing a high cognitive
48 demand on the agent (Sripada, 2020). Because of this high cognitive demand, the
49 task that you initially thought to be easy is actually difficult, as my account would
50 predict.

51
52 Now consider prospective memory, i.e., the ability to reliably remember and
53 execute a task in the future. For example, a physician engaging in a conversation
54 with a patient is cognizant that she must later remember, at the right time, to check
55 for blood pressure. Depending on how cognitively demanding the conversation is,

1 remembering to check the blood pressure may become difficult. The doctor would
 2 have an easier time maintaining her intention to check the blood pressure while
 3 absent-mindedly discussing the weather than while having to explain the
 4 incompleteness theorems: this is because the latter poses a higher cognitive
 5 demand. Now contrast this with a doctor who must remember to follow up with a
 6 patient in a week. Whether this task is difficult will depend on whether she can use
 7 a calendar or an assistant to remind her. If she does, the cognitive demand is low,
 8 and the task is easy. Imagine the patient forbids any such records and
 9 communication. Now the doctor must keep the upcoming task in her mind at all
 10 times so as not to forget. This poses a high cognitive demand. If she forgets, he
 11 could rightly claim that the patient's peculiarities made the task too difficult.⁵

12
 13 These cases were straightforward for the cognitive demand model. But what about
 14 cases where we cannot pinpoint a specific, discrete moment at which an agent's
 15 capacity for cognitive control was insufficient? Think of a child wanting to become
 16 an astronaut, or a writer struggling to finish a book. These cases are harder to
 17 accommodate in my model, because cognitive demand is typically not studied on
 18 such tasks. Nonetheless, cognitive demand helps illuminate these cases.

19
 20 In the first case, a plausible explanation is that the difficulty lies in breaking down
 21 the task into a structured, actionable plan (c.f. Murray, 2023). A child trying to
 22 become an astronaut simply does not yet know how to properly structure an
 23 actionable plan to become an astronaut. If such knowledge were simply
 24 unavailable, this story would not be best analysed in terms of cognitive control.
 25 But it is: there are books, blogs, and podcasts on how to become an astronaut, but
 26 consuming this information is far beyond the cognitive capacities of the child.
 27 Here, the cognitive demand view explains why this task may be impossibly
 28 difficult for a child, even if there is not one discrete moment at which the task
 29 fails.

30
 31 For another example, consider a procrastinating agent struggling to finish his
 32 taxes. Lebouc and Pessiglione (2022) examine such cases: they provide participants
 33 with complex forms to fill out over a span of 30 days. For some, this is easy; for
 34 others, it is difficult. They find that current computational models of cognitive
 35 control successfully predict participant procrastination behaviour and task failure.
 36 Why do cognitive control models explain procrastination behaviour? Here is one
 37 possibility: consider an agent who loathes filling out bureaucratic forms. Sitting
 38 down to complete the forms would require a great act of self-control in overcoming
 39 their aversion to initiating the bureaucratic task at hand. Such self-control imposes
 40 a cognitive demand (Sripada, 2020).

41
 42 This section considered different central cases of synchronic tasks from a cognitive
 43 demand perspective. More research is needed on the relationship between cognitive
 44 control and diachronic difficulty. But for now, the cognitive demand view looks
 45 well-positioned to contribute to our understanding of diachronic tasks.

46 ***Physical Difficulty***

47 Cognitive demand may strike the reader as a purely mental notion, inapplicable to
 48 cases of physical difficulty, such as performing an intricate dance or lifting a
 49 heavy weight. This misunderstands the domain-generalty of cognitive control,
 50 which is ubiquitous in physical performance. Physical cases are squarely in the
 51

⁵ See Murray & Vargas (2020) for a more thorough analysis of when agents' failure to generate action-appropriate attitudes in cases of diachronic omissions is culpable. Their analysis, like mine, centers on the reasonableness of (cognitive) demands upon agents.

1 domain of my account, or so I will argue. This is because our intuitions about the
2 difficulty of these tasks depend on their cognitive demand, such as the self-control,
3 discipline, and grit their successful performance requires, rather than the physical
4 aspects of the performance.

5
6 Consider the source of difficulty involved in extraordinary physical performances.
7 We admire the ballet dancer or weightlifter for having mastered difficult feats. Yet
8 mastery is acquired through gruesome years of practice, requiring considerable grit
9 and self-control (cf. Morton & Paul, 2019): mastering the skill clearly imposed a
10 high cognitive demand on the agent. Does our judgment about the difficulty of
11 these tasks stem from this acquisition phase of skill or strength, or the physical
12 force or resources involved in the feat? Isolating physical and mental aspects
13 makes it apparent that it is the acquisition and execution of the feat, not the
14 physical aspects of skilful performance, that is difficult.

15
16 Removing the grit and self-control required to acquire a skill intuitively reduces
17 the difficulty of physical tasks. Imagine a weightlifter who has doubled the
18 strength of their muscles purely through a magical pill: for them, lifting the weight
19 is now easy (while still being difficult for an average agent), and we consequently
20 are less impressed by their feats. This is despite the force and energy expenditure
21 required being identical to that required of a ‘clean’ weightlifter. In a popular
22 German fairy-tale, Kohlenmunk-Peter asks a mystic figure to imbue him with a
23 supernatural ability to dance. This makes it easy for him to dance, and the
24 onlookers lose their admiration upon eventually learning the truth. Imagine a
25 spasm at just the right time just happens to move your leg so that you score a
26 beautiful goal: it was not difficult for you to score.

27
28 Here are still more examples. It is difficult for a child to lift a pumpkin, while it is
29 easy for me, despite the force required and resources expended being equal. This is
30 because the child has less muscle and must exert self-control to push through the
31 lift. It is more difficult for a toddler to walk than for me: this is because the
32 toddler must still sequentially will their limbs into the right position, whereas my
33 gait has become automatic to me, inducing no cognitive demand. In such cases, it
34 is correct that facts about the body modulate difficulty. But this does not mean that
35 the difficulty in question is not proportional to cognitive demand. Rather, facts
36 about the agent’s body modulate difficulty by affecting the cognitive demand of
37 physical tasks. This can be tested empirically in dual-task interference
38 experiments. Here, subjects are asked to perform a parallel mental task while
39 performing a physical task, which typically leads to performance deteriorating, just
40 as mental fatigue does (MacMahon et al., 2023). These results provide converging
41 evidence for the claim that physical tasks induce cognitive demand.

42
43 We don’t have empirical data for all cases of physical difficulty. For example, lifts
44 at maximum weight are typically not studied in a dual-task interference paradigm,
45 because doing so presents a high injury risk. For another example, agents with a
46 debilitating physical condition like arthritis face an intense difficulty when moving
47 that seems tangential to cognitive demand. In both examples, evidence of a high
48 cognitive demand in less extreme conditions is emerging: at lighter weights or less
49 severe rheumatic conditions (MacMahon et al., 2023; Horata et al., 2022).
50 Nevertheless, extreme forms of these cases present uncharted empirical territory
51 for the cognitive demand view. A sceptical reader could easily adjust the account I
52 present to include other factors that contribute to physical difficulty, thereby
53 creating a novel hybrid account.⁶

⁶ I thank a reviewer and editor for these examples.

1
2 I have argued that the cognitive demands of training, task execution, and initiation
3 drive intuitive judgments about physical difficulty. Yet for most philosophical
4 purposes, whether my account of difficulty extends to physical difficulty is not a
5 central concern. In philosophical applications, we typically care about the mental
6 rather than the physical aspects of difficulty. For example, when we worry that an
7 ethical theory demands something too difficult from an agent, we typically think of
8 a tough choice or a heroic display of self-sacrifice (Chappell, 2019; McElwee,
9 2022), not impressive displays of strength. Nonetheless, it is a point in favour of
10 my account that it can make sense of our shifting intuitions regarding the difficulty
11 of physical tasks by appealing to the cognitive demand involved.

12
13 Is difficulty a unified phenomenon? This section reviewed heterogeneous cases of
14 tout-court difficulty, diachronic difficulty, and physical difficulty. They were
15 explained using the cognitive demand account. Future work may very well present
16 cases that the cognitive demand account fails to account for, making difficulty
17 correspondingly less unified. Hybrid accounts are possible: The cognitive demand
18 view could easily be combined with alternative proposals that handle these cases
19 differently. But for now, the cognitive demand account handles a broad range of
20 cases well without such additions, making a unified account of difficulty plausible.

21 22 **7. Effort and Difficulty**

23
24 Let us return to the question of what role effort plays in explaining difficulty. Is
25 the cognitive demand view an effort view? It seems natural to explain the difficulty
26 of a task in terms of the effort required to meet the difficulty of the task (Bradford,
27 2015; von Kriegstein, 2019; Chappell, 2019). This, naturally, raises the question of
28 what effort is (Massin, 2017; Bermúdez & Massin, 2023; Shepherd, 2023; Massin,
29 2024; Holton & Holton, forthcoming). If to make an effort would be to deploy
30 cognitive control,⁷ the cognitive demand view would be an effort view.

31
32 Again, a look at the empirical literature is instructive. Current models of the
33 feeling of mental effort view it as the phenomenological consequence of a cost-
34 benefit calculation that determines how we allocate cognitive control capacity
35 (Shenhav et al., 2013; Kurzban et al., 2013; Chong et al., 2017; Shenhav et al.,
36 2017, 2021). If cognitive control capacity is wasted on a high-cost or low-reward
37 task, such as listening to a boring story, switching the target to another task seems
38 beneficial to the individual. We invoked this mechanism in explaining the
39 diachronic difficulty of temporally extended, boring tasks. The aversive
40 phenomenology of mental effort, which typically intensifies for tasks with low
41 expected value, facilitates task-switching and requires self-control to overcome.
42 The evolutionary function of the feeling of effort is widely taken to be the
43 facilitation of task-switching. This is achieved by generating an aversive
44 experience when continuing to exert cognitive control on low-reward tasks
45 (Kurzban, 2016; Bermúdez, 2023; Holton & Holton, forthcoming). The connection
46 between the feeling of mental effort and cognitive control motivates the suggestion
47 that mental effort just is the deployment of cognitive control.

48
49 While I do not wish to develop and defend this proposal here fully, I want to
50 briefly highlight four advantages of the suggestion that making a mental effort is
51 simply deploying cognitive control.
52

⁷ Murray (2023) entertains this suggestion.

1 Firstly, it explains mental effort rather than having to posit effort as a primitive
 2 notion. Secondly, it explains how and why the feeling of effort and the effort itself
 3 correlate. In healthy cases, the current use of cognitive capacity is evaluated by the
 4 cost-benefit mechanism directly responsible for generating the feeling of mental
 5 effort that accompanies our actual mental efforts (Shenhav et al., 2013; Kurzban et
 6 al., 2013). In cases where this evaluation mechanism, rather than the capacity for
 7 cognitive control itself, breaks down, the feeling of effort is dissociated from the
 8 effort one makes. Indeed, this is exactly what we see in a lesion patient presented
 9 by Naccache (2006), who is perfectly able to make efforts at solving challenging
 10 tasks despite a complete absence of any feeling of effort. Thirdly, it explains why
 11 making an effort is an active, goal-directed phenomenon intimately tied to agency
 12 (Massin, 2017; Bermúdez & Massin, 2023). Cognitive control enables flexible,
 13 voluntary behaviour, which is central to agency (Buehler, 2018; 2022; Wu, 2022;
 14 Bianchi, 2025). Lastly, understanding effort as the deployment of cognitive control
 15 gives a harmonious account of the relationship between effort and difficulty. Effort
 16 concerns how we, in fact, deploy cognitive control capacity. In contrast, difficulty
 17 concerns how much cognitive control capacity one would have to deploy if one
 18 were to appropriately engage in the task, i.e., how much effort a task minimally
 19 requires. Hence, difficulty has a certain counterfactual aspect. Tasks that you never
 20 undertook (or even considered) can be more or less difficult for you, but tasks that
 21 you don't undertake are not efforts.

22
 23 For now, the suggestion that making a mental effort is deploying cognitive control
 24 remains speculative. I defend it at greater length elsewhere. If the speculation
 25 proves to be correct, the cognitive demand view of difficulty would explain
 26 difficulty in terms of effort required, making it an effort view. What would set it
 27 apart from current analyses of difficulty in terms of effort required would be that it
 28 rests on a novel analysis of effort that is intuitively and empirically plausible and
 29 philosophically informative by tying effort firmly to the psychological process that
 30 allows flexible, voluntary behaviour: cognitive control. If the speculation proves
 31 incorrect or unconvincing, the cognitive demand view would not be an effort view.
 32 This is no problem for the analysis of difficulty presented here, which is
 33 informative regardless of whether it is classified alongside existing effort views,
 34 such as those presented by Bradford (2015) or Chappell (2019) or as an entirely
 35 independent view.

36 37 **8. The Wide-Ranging Normative Roles of Difficulty**

38
 39 The cognitive demand account of difficulty explains difficulty as the proportion of
 40 an agent's cognitive control capacity required to succeed at a task. I have argued
 41 that this account explains difficulty better than alternative accounts proposed in the
 42 literature and gives a principled, empirically satisfying explanation of how learning
 43 modulates difficulty. I have furthermore argued that it captures the context-
 44 sensitivity of difficulty and generalises well to different kinds of difficulty we
 45 encounter in everyday life. But why do we need an account of difficulty at all?

46
 47 Throughout the paper, I have lamented that current accounts of difficulty are too
 48 narrow to cover the many normative debates invoking difficulty. A general proposal,
 49 such as the cognitive demand account, fares better. Applying a unified account of
 50 difficulty makes normative projects that currently seem disconnected appear more
 51 closely related than previously believed. Such connections are only made visible by
 52 a unified, broad-scoped account. Its novel features, such as the appeal to a capacity-
 53 limited mechanism and appropriateness conditions on cognitive demand, enable
 54 genuine philosophical progress in debates that invoke difficulty. I will briefly sketch

1 three ways in which the cognitive demand view can make such progress. I leave a
 2 more complete treatment of these matters to another time, being confident that these
 3 brief discussions suffice to show the wide-ranging normative applications of the
 4 novel account of difficulty defended here.

5 6 *Moral Responsibility*

7 Philosophers have noted that difficulty excuses mistakes in peculiar ways (Eriksson,
 8 1996; Nelkin, 2016; Guerrero, 2017). For example, if a task is very difficult, and
 9 you make a mistake despite trying hard (i.e., devoting an adequate amount of
 10 available cognitive control capacity), you are not blameworthy. Yet difficulty does
 11 not excuse simpliciter: if a task is very difficult and you make a lukewarm attempt,
 12 you are not excused. For example, a medic who focuses entirely on the difficult
 13 procedure but fails to extract the bullet without damaging the patient's organs may
 14 be excused even if this causes the patient's death. We would not excuse the same
 15 mistake at an identically difficult task if a lazy medic did not try very hard. Why is
 16 that so? From the cognitive demand view, this result naturally follows because of
 17 the capacity limitation of cognitive control. A very difficult task requires a high
 18 cognitive demand, so an appropriate attempt necessitates the agent's total cognitive
 19 control capacity. Once an agent meets that demand, there is no further cognitive
 20 control capacity to allocate to increase the chance of success further.

21
 22 The mistake of the diligent medic is thus non-culpable: it would have been
 23 impossible for her to do more than she did. The same is not true for the mistake of
 24 the negligent medic: they could and should have done otherwise by devoting more
 25 of their cognitive capacity to the task. Failing to do so reveals a lack of care: when
 26 a life is on the line, a serious attempt is normatively expected. In this way, the
 27 cognitive demand view of difficulty explains when and why agents bear moral
 28 responsibility for failure at difficult tasks.

29 30 *Achievement*

31 Another domain in which difficulty is often invoked is that of achievements. What
 32 are achievements, and why are they valuable? The orthodox account takes
 33 achievement to be the performance of effort-requiring (read: difficult) action brought
 34 about in a way one understands sufficiently well. The value of achievements is
 35 explained by efforts being a uniquely human capacity, the exercise of which is
 36 intrinsically valuable (Bradford, 2013; 2015; 2016). I believe this is incorrect:
 37 efforts are not a uniquely human capacity since animals such as chimpanzees, dogs,
 38 and cats can undoubtedly make efforts.

39
 40 Nor are efforts always valuable intrinsically. In particular, inappropriate efforts are
 41 not valuable. Imagine trying to add 1 to 2714 by counting upwards from 1. This is
 42 clearly an inappropriate effort: less effortful ways to add these numbers are
 43 available. But since it is effortful and something one can competently do, it counts
 44 as both a difficult task and a valuable achievement on Bradford's view. This allows
 45 agents to create intrinsic value by taking inappropriate, difficulty-inflating
 46 approaches to complete tasks, and leads to a highly suspicious classification of
 47 completed tasks as achievements. On the cognitive demand view of difficulty,
 48 making an inappropriate effort does not increase the task's difficulty, and so does
 49 not bring about a valuable achievement. Since difficulty is relative to the appropriate
 50 (i.e., minimal) cognitive control required of the agent by the task, choosing effort-
 51 inflating means to perform the task does not inflate its difficulty, value, or status as
 52 achievement— it only makes it more effortful.

53
 54 If achievements are not intrinsically valuable, why do we care so much about them?
 55 I'd suggest examining the various affective responses and ideas of ownership that

1 can arise from difficult actions. We often find ourselves highly valuing the product
 2 of our own difficult labour. The well-replicated Ikea effect, where people value
 3 things they have assembled themselves more than the ones they bought pre-made
 4 (Norton et al., 2012; Sarstedt et al., 2017) is an instance of this “paradox of effort”
 5 (Inzlicht et al., 2018). Self-assembly poses a higher cognitive demand than just
 6 buying higher-quality premade products. The cognitive labour reflected in the goals
 7 we set, the skillful control we used, and the persistence we showed leads us to
 8 identify with the product we created. Not surprisingly, researchers do indeed find
 9 that the value participants ascribe arises from a sense of (intellectual) ownership of
 10 the product (Sarstedt et al., 2017). These products of our labour are valued because
 11 of what they reveal about ourselves – even if that is sometimes just that we can
 12 follow Ikea assembly instructions.

13 *Moral Demandingness*

14 Can a moral theory be too demanding? Demandingness objections claim that moral
 15 theories that ask agents to sacrifice too much of their own welfare should be revised
 16 or given up (Hooker, 2009; van Ackeren, 2018). Real-world cases of Moral Burnout,
 17 a condition prevalent among healthcare workers in understaffed hospitals (Sundin-
 18 Huard & Fahy, 1999), illustrate the plausibility of moral demandingness objections.
 19 Moral Burnout is a chronic stress disorder caused by acute stress from frequently
 20 experiencing and mentally revisiting one’s moral failures obsessively.

21
 22 Yet, this real-world disorder does not align with the philosopher’s exclusive focus
 23 on welfare and is largely overlooked in the literature. Individuals with moral burnout
 24 focus primarily on the demands placed upon patients’ thoughts and agency,
 25 highlighting that agents cannot simply stop thinking about the high stakes of their
 26 every action, and often become obsessed with revisiting their moral failures.

27
 28 The cognitive demand view takes such self-reports seriously. Consider the following
 29 proposal: When doing good brings us to the limits of our capacities, moral theories
 30 become demanding. The capacity for cognitive control is one such limited capacity.
 31 Agents who become obsessed with their moral shortcomings, such as in the case of
 32 moral burnout, pose high demands on this limited cognitive capacity. For them,
 33 pursuing their moral aims incurs a great cognitive demand, as they struggle greatly
 34 to suppress their urge to revisit past moral failures. Their case is better explained by
 35 the difficulty rather than the well-being cost involved. Current analyses of
 36 demandingness as difficulty (Chappell, 2019; McElwee, 2022) lack a solid empirical
 37 foundation. They can be strengthened by adopting the cognitive demand account,
 38 which ties difficulty to a capacity limitation and captures cases like Moral Burnout,
 39 in which hitting the limits of this capacity limitation reveals the excessive (often
 40 self-imposed) cognitive demand these agents face. Taking seriously the self-report
 41 of agents who struggle with Moral Burnout requires broadening the scope of which
 42 capacities are subject to moral demands. A view of difficulty that emphasises
 43 cognitive demand and capacity limitations can thus enrich our understanding of
 44 demandingness.

45 **9. Conclusion**

46
 47
 48
 49 Difficulty plays a prominent role in many philosophical debates yet is poorly
 50 understood. I proposed a new account of difficulty built on advances in our
 51 understanding of cognitive control capacity and learning, two phenomena closely
 52 tied to difficulty. This convergent body of research suggests that difficulty is
 53 proportional to the amount of cognitive control capacity a task requires of an agent
 54 in a given circumstance. I dubbed this the cognitive demand of a task. Recent work

1 on difficulty and demandingness (Chappell, 2019; McElwee, 2022), difficulty and
 2 skill (Bermúdez & Felletti, 2021; Pacherie & Mylopoulos, 2021), the nature of effort
 3 as it relates to difficulty (Bradford, 2015; Massin, 2017; Shepherd, 2023; Bermúdez,
 4 2023; Bermúdez & Massin, 2023) and difficulty and epistemic responsibility
 5 (Guerrero, 2017; Bradford, 2017; Munton, 2023) illustrates the need for an
 6 empirically plausible account of difficulty and presents fruitful further avenues of
 7 research. Given the proliferation of appeals to difficulty in philosophical debates, it
 8 is time for philosophers to develop a more precise, unified picture of the nature of
 9 difficulty. To this end, I have proposed a novel, empirically plausible, and
 10 philosophically fruitful account of difficulty as cognitive demand.

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