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Pain Experiences and Their Link to Action

Challenging Imperative Theories

Abstract: *According to pure imperativism, pain experiences are experiences of a specific phenomenal type that are entirely constituted by imperative content. As their primary argument, proponents of imperativism rely on the biological role that pain experiences fulfil, namely, the motivation of actions whose execution ensures the normal functioning of the body. In this paper, I investigate which specific types of action are of relevance for an imperative interpretation and how close their link to pain experiences actually is. I argue that, although imperative theories constitute an apparently promising version of strong intentionalism, they cannot provide an imperative content that meets their own criteria of sufficiency and necessity. I further argue that this issue cannot be solved by impure imperative theories either.*

1. Introduction

What makes an experience a *pain* experience? In the philosophical literature, many accept that pain experiences possess a particular *phenomenal character*, i.e. a sensational property that types experiences by what it is like for a subject to undergo them (Byrne, 2001). Pain experiences, such as cutaneous pains of punctures, cuts, or burns as well as fracture pains, muscle pains, intestinal pains, headaches, or phantom pains, all share a phenomenal character distinct from the sensational properties of other kinds of experiences, such as of hunger, itching, fear, disgust, or grief. In this sense, pain experiences seem

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phenomenologically real and robust (Aydede and Fulkerson, 2019). Some authors consider pain experiences to be sensations that must be reduced to this sensational property (Aydede, 2019; McGinn, 1996; Rorty, 1980). They particularly deny that pain experiences possess an *intentional content*, i.e. that they have the property of being directed towards something beyond themselves.

By contrast, intentionalists assume that pain experiences possess an intentional content. *Strong intentionalists* in particular posit that the phenomenal character of pain experiences can be entirely reduced to such content (e.g. Bain, 2007; Klein, 2015a; Tye, 1997). For an experience to be a pain experience it is thus necessary and sufficient that it has a certain intentional content. This, it is claimed, makes possible the naturalization of pain experience and its phenomenal character. Strong intentionalists further maintain that the intentional content of pain experiences determines their variation in felt location (e.g. skin, bone, viscera, or head), intensity (e.g. mild, moderate, or severe), and quality (e.g. stinging, burning, aching, or cramping). On this view, any differences in phenomenal character must correspond to differences in intentional content (e.g. Bain, 2007; Klein, 2007; 2015a).¹

Despite these commonalities across strong intentionalist accounts, the main subject of discussion remains how best to define the intentional content of pain experiences. Those theories that reduce the phenomenal character of pain experiences to a single intentional content have dominated the philosophical debate. Most prominently, philosophers posit that the intentional content of pain experiences is *indicative* of the presence of a bodily condition of some sort (Bain, 2007; Cutter, 2017; Cutter and Tye, 2011; Tye, 1997). According to this indicative view, in experiencing pain we experience a certain part

¹ It should be noted that the proper intentional content of pain experiences might not capture their felt unpleasantness, painfulness, or hurtfulness, because this affective aspect is often not considered essential to the phenomenal character of pain experiences. It is an ongoing debate whether pain experiences are necessarily unpleasant. Particularly due to the experiences of asymbolic patients (Berthier, Starkstein and Leiguarda, 1988), many philosophers have concluded that this is not the case (e.g. Corns, 2014; Klein, 2015b). For present purposes, it is most relevant that strong intentionalists typically consider unpleasant pain experiences to be composed of a proper intentional content distinct for pain experiences and an additional intentional content that accounts for their unpleasantness (Bain, 2013; 2017; Klein, 2015a; Martínez, 2011). Being felt as unpleasant is, however, no unique characteristic of pain experiences (e.g. Bain and Brady, 2014). Considerations regarding the unpleasantness, painfulness, or hurtfulness of pain experiences are therefore set aside in the following.

of the body as being damaged, disturbed, or disordered. In recent years, indicative theories have come under increasing criticism (Coninx, forthcoming a; Corns, 2014; Klein, 2017; Martínez and Klein, 2016; Pautz, 2010).

An alternative position has recently emerged. While still committing to central ideas of strong intentionalism, imperativism claims that the intentional content of pain experiences is *imperative* (Klein, 2007; 2012; 2015a; 2017; Klein and Martínez, 2019; Martínez and Klein, 2016). Pain experiences are bodily commands that do not indicate a particular bodily condition but demand that subjects act in a particular manner. Pain experiences are action-guiding signals specifying the state in which the world should be, not the state in which the world actually is. Imperative theories have three decisive advantages over indicative versions of strong intentionalism.

First, the tight link between pain experience and body state that is often put forward as an argument in favour of indicative theories does not exist (e.g. Corns, 2014; Klein, 2015a). This is due to the heterogeneity of conditions involved in the elicitation of pain experiences (Apkarian, Bushnell and Schweinhardt, 2013; Bingel and Tracey, 2008) as well as the systematic blindness of the pain system to bodily damage, disturbance, or disorder (Apkarian, 2017). Imperativists are not committed to the idea that there is a *type of bodily state* that pain experiences reliably indicate (e.g. Klein, 2012). By contrast, the *type of action* they command unifies experiences of the phenomenal type in question.

Second, imperativists can account for the *intrinsic motivational force* of pain experiences as an essential aspect of their phenomenology (Klein, 2012; 2015a; 2017). In experiencing pain, subjects feel inherently motivated to act without further thought. The motivational force of pain experiences comes directly from their imperative content. This is independent of whether they are in addition experienced as unpleasant or not. For example, the stinging pain of stepping on a pin immediately drives us to withdraw the limb, the pain of sunburned skin makes us prevent contact with the burned part of the body's surface, and the experience of a cramping femoral muscle during running exercises strongly motivates the avoidance of continued muscular activity.

Third, imperativists seem to provide a *plausible biological story* concerning the function that pain experiences are supposed to fulfil (Klein, 2012; 2015a; 2017; Klein and Martínez, 2019; Martínez, 2015; Martínez and Klein, 2016). According to the imperative view, pain

experiences serve survival as they reliably demand actions appropriate with regard to the subject's physiological well-being. 'On the whole, then, pains command us to do things that will keep our bodies intact and well-functioning' (Klein and Martínez, 2019, p. 13). Withdrawing the foot when stepping on a pin prevents the occurrence of injury. Not touching burned skin or using stressed muscles prevents the aggravation of existing injury. Pain experiences fulfil this biological role by directly informing subjects how to act. No elaborate considerations are required to find out how best to react to a certain body condition, for example. Thus, imperative theories can do justice to the basal function of pain experiences in the guidance of appropriate action.

Taken together, imperativism constitutes a serious alternative to indicative versions of strong intentionalism for the naturalization of pain experiences and their phenomenal character. It is most radically defended by Colin Klein (2007; 2012; 2015a; 2017), so far the only representative of *pure imperativism*. According to him, pain experiences can be entirely reduced to a single imperative content. The core of this paper (§2–3) focuses on his theory. Manolo Martínez has also developed an imperative theory of the affective aspect of subjective sensation. With respect to pain experiences, Martínez (2011) originally considered the relevant intentional content to be composed of an indicative and imperative element, similar to the view defended by Richard Hall (2008) who initiated the imperative current. In recent work, Martínez (2015) has integrated typically indicative elements into an imperative content. These variants of *impure imperativism* will be addressed independently as less radical versions of imperativism (§4).

Imperativism is confronted with different points of criticism.² The most relevant point for present purposes is David Bain's (2011) and Laura Tumulty's (2009) argument that the link between pain experience and action is not as close as imperativists must assume in order to defend the necessity and sufficiency of the intentional content in question. Their objections are directed against an earlier version of Klein's theory (2007). According to this version, pain experiences are

² An overview of current fields of discussion in the philosophy of pain, including criticism of imperative theories, can be found in Corns (2018). For example, it is still up for debate whether and how imperative theories can account for pain experiences of asymbolics that apparently do not motivate patients to act in any way. This issue has given rise to a controversial yet fruitful debate on the nature and origin of bodily care (Bain, 2014; de Vignemont, 2015; Klein, 2015b; 2016).

negative imperatives, i.e. proscriptions against present or future motion. The criticism of Bain and Tumulty may seem obsolete in view of the revised and more sophisticated version of pure imperativism (Klein, 2015a; 2017) that defines pain experiences as positive imperatives commanding protective actions. This paper challenges this more recent version of imperativism while considering Klein's reply to previous objections.

In order to evaluate the plausibility of pure imperativism there are a few things to keep in mind. First, if we recognize that pain experiences are unified by means of a unique phenomenal character, then imperativists need to provide a *type of imperative content* that is sufficient as well as necessary. 'The difference between someone in pain and someone not in pain is just the presence or absence of an imperative' (Klein, 2007, p. 522). It must be ensured that the imperative content can be assigned to all different pain experiences and only experiences of this phenomenal type. Second, the identification of the relevant imperative is primarily grounded on the assumption that the biological role of pain experiences is to reliably trigger a specific *type of action* (e.g. Klein, 2015a; Martínez and Klein, 2016). In the light of this argument, the plausibility of the imperative view depends on the identification of a type of action that all pain experiences are supposed to bring about without characterizing experiences of a different phenomenal kind. Otherwise, we lack a compelling biological story to introduce a content necessary and sufficient for pain experience. The whole matter is complicated by the fact that the imperative content must accommodate variations in location, intensity, and quality.

I will argue that pure imperativism is not up to the challenge, not even in its revised and most sophisticated form. I intend to prove this by relying on the very characteristic that imperativists themselves regard as crucial: *biological function*. On the one hand, the suggested imperative content does not allow for a clear-cut distinction between pain experiences and emotions, at least not in reference to the biological role they play. This *demarcation problem* prevents the sufficiency criterion from being met. On the other hand, we lack a compelling biological story to identify all pain experiences with the suggested imperative content given the heterogeneity of appropriate actions that they motivate. This *unification problem* prevents the necessity criterion from being met. Thus, imperative theories seem to satisfy neither the criterion of sufficiency nor necessity, at least as long as the crucial factor is biological function. Interestingly, these issues also occur for impure imperativism, even if we leave aside

those additional issues arising from the incorporated indicative element.

This paper proceeds as follows: in §2, I outline more carefully the main assumptions and arguments of the pure imperative theory defended by Klein. This allows us to set out the debated link between pain experience and action. In §3, I aim to show that the proposed imperative content can be neither necessary nor sufficient based on the argumentative strategy that imperativists consider relevant. In §4, I critically discuss the attempt to save imperativism by further integrating indicative elements. Finally, §5 summarizes the main insights of the paper.

2. Motivating Imperativism

Imperative theories rely on the idea that pain experiences are best characterized as action-guiding signals with imperative content. In order to critically examine this basic assumption, we first look at the close underlying link between pain experience and action. Interestingly, this link is considered both flexible and inflexible (Klein, 2015a; 2017). This apparent contradiction can be resolved by understanding pain experiences as bodily commands for *purposive* and *impulsive* action.

The effects that pain experiences bring about are not the same as autonomous reactions or involuntary reflexes (Klein, 2007; 2015a; 2017). The relation between pain experience and action is more flexible and context sensitive. For instance, in the case of a broken ankle, the corresponding aching pain experience motivates the avoidance of using or putting weight on the fractured bone. In view of this command, subjects can choose between various concrete ways to obey the command, such as using crutches or limping, depending on the options available in the relevant context. This flexibility in voluntary behaviour is the reason why the underlying processes are mediated consciously. As Klein argues, ‘when there’s nothing that an organism can do about a state, it makes little sense to have a sensation that is associated with it’ (Klein, 2015a, p. 17). In other words, pain experiences motivate purposive actions, i.e. bodily movements that are under the guidance of the person acting (Frankfurt, 1978).³

³ In view of different studies in cognitive science, it must be carefully considered whether purposive actions are actually guided by an agent or subpersonal motoric processes (e.g.

The effects that pain experiences bring about are not the same as goal-directed actions mediated by deliberative processes. Pain experiences immediately motivate the subject to act without the need to consider objectives, weight pros and cons, and infer most promising behavioural strategies (Klein, 2015a; 2017). Beliefs and desires may suppress the execution of an action, but they do not remove the motivational force of the pain experience. Subjects might flexibly choose when and how exactly they give in to the urge to act but they do not need to deliberate about whether they need to act or on what they need to do in more general terms. The actions to perform in response to a pain experience are ‘often quite inflexible and context *insensitive*: the pain of a broken ankle weighs against walking, quite regardless of your other goals’ (Klein, 2017, p. 51). In other words: pain experiences motivate impulsive actions, i.e. purposive movements that are explicitly not preceded by deliberation (Frijda, Ridderinkhof and Rietveld, 2014).⁴

The plausibility of the idea that pain experiences constitute bodily commands to act is primarily based on considerations regarding their biological purpose. It seems to be common sense that pain experiences function as constant reminders to take care of the body in order to avoid the occurrence of potential physiological threats or to promote recuperation and recovery (e.g. Williams, 2017). The tight link between pain experience and action presents a basic phylogenetic and ontogenetic opportunity to preserve and regain bodily integrity (Klein, 2015a; 2017). Pain experiences purposefully guide subjects in the performance of appropriate actions while no further reasoning is required to identify such actions. Following the commands of pain experiences reliably ensures the intact biological functioning of the body. This also corresponds to the assumption that the priority of pain processing is the immediate reorientation of actions rather than the provision of detailed information concerning the physical condition of the subject on the basis of which further decisions might be taken (e.g. Beck and Haggard, 2017; Wall, 1979).

Bayne and Pacherie, 2014; Pacherie, 2008). Considerations of this kind are put aside in this paper in order to enable as stringently as possible a discussion of the imperative view.

⁴ In this paper, I focus on the concrete actions that pain experiences are supposed to reliably bring about in the protection of bodily integrity. I will not address normative issues of whether imperatives can provide (motivating and justifying) reasons to act (for a more detailed discussion see Aydede and Fulkerson, 2019; Bain, 2011; Klein, 2015a; Martínez, 2015).

Not every pain experience needs to fulfil the function of keeping the body intact. Imperativists can explain pathological cases, such as phantom pains. According to Klein, ‘the pain *system* is constructed so as to produce imperatives that promote well-being in most cases, mostly reliably, in most circumstances, for most people’ (Klein, 2015a, p. 114). Misfires cannot be ruled out. Klein (2012; 2015a) construes misfires as experiences with unaltered motivational force, yet with unsatisfiable or inappropriate imperatives, and argues that this accounts for the frustrating characteristics of pain disorders.⁵ This corresponds to the insight that they have an existential impact on the quality of life of concerned patients (e.g. Breivik *et al.*, 2006). The restriction or return of mobility plays a substantial role in the chronification of pathologies as well as their treatment (e.g. Turk and Flor, 2013; Van Dieën, Flor and Hodges, 2017; Williams, 2017).⁶

We can now turn to the question of what type of imperative content Klein has in mind in his recent work (2015a; 2017). According to the position defended there, the imperatives necessary and sufficient for pain experiences express *commands to protect the body*. This is not yet the complete story. Imperativists need to provide an imperative specifying which action has to be taken. Demanding the protection of the body does not contain any information on how to achieve this aim. Moreover, the type of imperative content must account for variation in felt location, intensity, and quality. The attractiveness of imperativism relies substantially on the traceability of these phenomenal properties to intentional properties (e.g. Klein and Martínez, 2019). Imperativists need a more complex intentional content ‘with enough varying parameters to capture the variations present in everyday pains’ (Klein, 2017, p. 56). In his recent monograph (2015a), Klein provides this kind of complex imperative content.

⁵ Martínez (2015) calls those experiences ‘spammy pains’ that turn out to be bad advisors in the guidance of action.

⁶ It shall be noted that indicative theories have not ignored the motivational force of at least unpleasant pain experiences. Evaluative theories posit that pain experiences indicate the presence of a bodily condition while unpleasant pain experiences encompass an additional content expressing the badness of this condition (Bain, 2013; 2017; Cutter and Tye, 2011). Evaluativism does not presuppose the belief that the respective bodily condition is bad for a subject, as the badness impresses itself (e.g. Bain, 2017). However, further deliberations are needed in order to decide how to act in the face of such badness. This seems too demanding, at least if we assume that the earlier reflections on the link between pain experience and action are correct.

Klein (2015a) now holds that pain experiences constitute commands to protect a specific body part, in a specific manner, with a specific urgency.⁷ A subject experiences pain as located in the body part that is the object of concern. For instance, a subject experiences pain in a limb, bone, muscle, or inner organ when the demanded protective action is directed towards this body part. The felt intensity expresses the priority of the corresponding protection command, ranking its satisfaction relative to others.⁸ For present purposes it is most important that different qualities are captured in terms of different protective actions. The imperatives of pain experiences do not solely express proscriptions against motion, as assumed in earlier versions. They can also express active protection commands to withdraw or defend as well as passive protection commands related to the avoidance of use, refraining from continued muscular contraction, or the provision of a continuous warning against contact. In experiencing pains of specific qualities, the body immediately motivates specific actions with respect to those body parts that are supposed to be protected.⁹

The stinging pain of stepping on a pin commands the withdrawal of the affected limb. Cramping pain in the femoral muscle during a run demands the avoidance of tension on this muscle. The burning pain of a full-body skin burn motivates us to prevent the skin surface from coming into contact with objects of any sort. The aching pain of a broken ankle forces the avoidance weight bearing on the fractured bone by, for example, walking. Thus, pain experiences do not merely demand, for example, the protection of a limb, but the protection of the limb in a certain manner by doing something with it, refraining from doing something with it, or preventing something being done to it. This seems to be the only way to do justice to the variation across

⁷ In more detail, Klein (2015a) defines the imperative content as follows: ‘Keep *B* from *E* (with priority *P*)!’ *B* reflects the part of the body to be protected and corresponds to the felt location. The position of the variable *E* is taken by a gerund of the kind of action to be performed and corresponds to the respective felt quality. *P* stands for a ranking function related to felt intensity.

⁸ Klein and Martínez (2019) have jointly developed a more detailed account of this matter. In the course of this paper, the aspect of intensity is mainly ignored and treated as unproblematic.

⁹ Determining the exact correspondence between different qualities and different categories of protective actions constitutes the subject of ongoing debate (e.g. Coninx, forthcoming b; Corns, 2018; Klein, 2015a; 2017). Here, I will consider paradigmatic imperatives, in accordance with Klein’s own examples.

pain experiences and the requirement that their phenomenology specifies all relevant instructions for action.

To summarize, the imperative content is supposed to satisfy the criteria of sufficiency and necessity. Imperativists must provide a certain type of imperative that all pain experiences and exclusively such experiences possess (e.g. Bain, 2011; Klein, 2017). Such criteria are supposed to be satisfied by protection imperatives expressing the command to perform certain actions with respect to certain parts of the body. Given the aim of imperativists to cash out the biological role of pain experiences, two kinds of scenario might prove problematic: (i) cases in which relevant protection commands can be ascribed to non-pain phenomena based on the type of appropriate actions they motivate; (ii) cases in which imperativists fail to provide a plausible biological story to explain why certain pain experiences should be identified with protection commands of the right sort. These cases are problematic because they contradict the assumption that the imperative content is either sufficient to distinguish pain from non-pain phenomena or necessary to account for all kinds of pain experience. Both kinds of scenario will be discussed in the following under the headings of the problem of demarcation and the problem of unification.

3. Challenging Imperativism

3.1. *Sufficiency and the problem of demarcation*

The first objection shows that the proposed imperative content is not sufficient for pain as it specifies actions which have a correspondingly intimate link with *emotions*. This is especially true of *fear* and *disgust*, which can reliably motivate the same purposive and impulsive actions appropriate for the protection of the body's functioning in the given context. On the assumption that biological function is decisive for the attribution of an intentional content, it follows that experiences of different phenomenal types possess the same type of imperative content. This demarcation problem contradicts the criterion of sufficiency.

Targeting Klein's earlier version of imperativism, Bain argues that pain experiences are not the only phenomena that are to be construed as proscriptions against action. As he puts it, 'suppose you're on a cliff edge and have the urge not to step forward. If some urges are constituted by experiential commands, why not this one?' (Bain, 2011, p. 178). This is not a counter-example to Klein's more recent version

of the theory. On this theory, pain experiences do not command the cessation of what a subject is doing in a certain moment but the performance of *specific protective actions* with respect to *specific body parts*. The corresponding imperative content arguably does not apply to the example Bain provides. However, the cases I construct in the following apply the general idea of his critique to Klein's more sophisticated version of pure imperativism.

Suppose that a subject experiences a sharp stinging pain in the hand when touching nettles. Following Klein's reasoning, this experience specifies a particular action, namely the withdrawal of the part of the body in which the pain is felt. This not only corresponds to the motivating phenomenology of such pain experience, the imperative also characterizes exactly the action that seems appropriate in the situation. Withdrawing the hand prevents skin punctures by stinging hairs and the injection of substances causing swelling and skin irritation. Now imagine the panicked fear of someone seeing a spider touching their hand. For the sake of the argument, let us also assume that this scenario is located in a region of the world where there are indeed dangerous spider species. In their fear, these people experience a strong motivation to withdraw their hand, which clearly has the function of protecting bodily integrity, for example, by preventing bite wounds in the hand or the transmission of toxins.¹⁰

As a second example, imagine a person with sunburn that affects those body parts that are typically not covered (e.g. face, lower arm, hand). Following Klein's reasoning, this pain experience specifies a particular protective action: no object should touch the skin surface in the respective areas. This prevents infections and promotes an undisturbed and fast healing process. Now imagine the disgust of a person located in a completely unsterile environment, say a garbage dump, train station rest room, or a friend's student flat. For the sake of the argument, let us also assume that the skin of such a person is not covered in the same places where the sunburn is located in the sunburn case. The person who feels disgust is directly motivated to have no skin contact with any object in the given situation. Moreover, this behaviour prevents the transmission of pathogens that could affect the body's proper functioning or cause skin rashes to the touched region of the body.

¹⁰ For a more detailed discussion of the complex relation between pain and fear, see Coninx (forthcoming b).

The strong overlapping of the characteristics of pain experiences and emotions is not surprising. Pain experiences are frequently considered as *subforms* or *precursors* of emotions (e.g. Denton, 2006; Strigo and Craig, 2017), not least because of the fact that both immediately drive the subject to perform specific actions. The fear in response to a spider directly motivates the subject to act in a certain manner without the need to deliberate whether the animal is actually dangerous or how best to react in the situation. Basic emotions typically seem to reveal a motivating phenomenology functioning as a direct instruction for action. Theories that interpret emotions as felt tendencies to act or perceptions of affordances (e.g. Frijda, Ridderinkhof and Rietveld, 2014; Hufendiek, 2017) strike a similar note by presupposing an intimate link between emotion and action. Interestingly, Klein (2015a) admits that some emotions are best construed as imperatives and not as indicative or desire-like states. The intentional content of fearing a spider does not express the danger posed by the animal or the desire to avoid contact with such an animal. However, this does not explain how the imperative content of emotions is supposed to differ from that of pain experiences.

It is of course possible to avoid this issue by ascribing an imperative content to emotions that differs in some way or another from the imperative content of pain experiences. For example, the experience of fear when seeing a spider touching one's own hand might be reformulated as the command to get away from the animal instead of performing a certain action with the hand. Thus, the imperatives of the considered fear and pain experience are no longer identical as the former is directed towards an external object while the latter demands an action to be performed with a certain body part. However, this solution is not attractive for imperativists, who hold that the ascription of an imperative content should not merely constitute a theoretical move but should rely on biological considerations. The pain experience of touching nettles can be identified with the command of getting away from an object because it motivates the same appropriate action as the fear experience considered above: the protection of the hand from irritation or injury. Moreover, when we further integrate the concrete objects (e.g. spider vs. nettle) in the imperative content, then the ambition to provide a type of imperative that not only applies to individual cases of pains or emotions, but to all experiences of the respective type, must be abandoned.

3.2. *Necessity and the problem of unification*

The second objection challenges the necessity of the suggested imperative content. Protection commands are supposed to be comprehensive and to apply to all different kinds of pain, including the notoriously stubborn class of *visceral pains* (e.g. intestinal pains, stomach aches, kidney pains) and *headaches* (Bain, 2011; Cutter, 2017; Tumulty, 2009). In the light of the earlier version of Klein's account, it seems implausible that visceral pain experiences can correspond to proscriptions against action: inner organs are not subject to voluntary control. Moreover, which actions should we refrain from doing with our head when experiencing a headache? In the light of Klein's more recent version, however, these problems seem to solve themselves. Klein now holds that 'one can still protect a body part over which one has no voluntary control' (Klein, 2017, p. 54). Visceral pain experiences or headaches may simply demand the protection of an inner organ or the head. But as I will show, the devil is in the details.

The biological role of pain experiences is to keep the body intact. They do so by informing the subject about the body part to be protected and the manner in which this is to be done. The imperative expresses the command to perform a specific action directed towards a specific body part corresponding to a felt quality and location. In accordance with the examples provided in §2, the experience of cramping intestinal pain, for example, must demand the avoidance of muscular activity. The experience of aching pain in the head must demand the avoidance of using or putting pressure on the head. As such, the original issues reoccur (see also Coninx, forthcoming b; Cutter, 2017). It remains unclear how subjects should intentionally satisfy the command of avoiding muscular activity in the intestines and how the avoidance of use of, or bearing weight with, the head should contribute in any reasonable sense to the body's integrity. This is especially difficult, given that subjects often act in the exact opposite manner by, for example, massaging their temples.

These issues do not constitute a problem for imperativism *per se* and every apparent counter-example must be considered carefully (Corns, 2018). Klein does not need to assume that all pain experiences keep the body healthy. Pain experiences of bowel cramps can be construed as unsatisfiable commands. Headaches could be considered functionally cryptic: their satisfaction may be possible but somehow inappropriate in a given situation (Klein, 2015a; 2017). Both would

constitute protection commands with the same imperative content as all other pain experiences. They are thought of as misfires of an otherwise well-functioning system. The crucial question is whether this story is convincing.

In contrast to paradigmatic pathologies, such as phantom pains, both visceral pains and headaches represent widespread phenomena within society and everyday life (Burch *et al.*, 2015; Halder and Locke III, 2009). Given their sheer numbers, one would have to assume that the pain system works along a ‘better-safe-than-sorry’ principle in order to explain the resulting rate of misfires (e.g. Millikan, 2004). Klein (2015a) himself rejects this option as implausible given the exceptionally high ecological costs of pain experiences. Pain experiences are not just automatic reactions that use few resources. On the contrary, they attract attention, interrupt cognitive processes, change behaviour, and trigger further emotional reactions. As such, misfires of the pain system should prove to be rare exceptions. Moreover, as I will show in a moment, headaches and visceral pains do contribute to the body’s proper functioning, just not in a manner corresponding to the imperative content in question.¹¹ In particular, they do not motivate the subject to withdraw, limit movement, use, or activity of, or avoid contact with the intestines or head.

Bowel cramps tend to cause people to take up an embryonic position, massage the lower part of the abdominal region, or warm it up by different means. These behaviours allow cramps to ease, as changes in mechanical and temperature-related activation cause beneficial changes in blood flow while the musculature of the inner organ remains active. In infants, these experiences also manifest themselves in strong expressive behaviour (e.g. screaming or rolling around). Such behaviour attracts the attention of caregivers whose interventions are often necessary given the helplessness of newborns.¹² Headaches can also contribute to bodily protection in different manners (Montagna, Pierangeli and Cortelli, 2010). In the case of a migraine, motor inactivity and sensory deprivation help to restore the

¹¹ Coninx (forthcoming b) has drawn similar conclusions, though partly in the context of the discussion surrounding indicative versions of strong intentionalism.

¹² Facial expressions, gestures, or exclamations seem to play a crucial role in effectively communicating pain and thereby triggering reactions from significant others who provide support in the protecting and restoring of physical health. This seems to be true not only for infants and not only in case of intestinal pain experiences (e.g. Finlay, 2015; Williams, 2002).

stress-prone internal balance of body and brain. Individuals suffering from cluster headaches tend to be more active and restless, triggering adaptive ‘fight-or-flight’ responses to external stressors.

In the case of bowel cramps, pain experiences might prove useful by means of the active manipulation of the body or non-verbal communication. In the case of headaches, pain experiences might prove useful in the motivation of passive or active avoidance behaviour that is not directed towards the head but expresses itself in general lethargy or agitation. Moreover, none of the described actions seem to rely on deliberations concerning whether they are the best actions to perform in the given circumstances. Thus, based on their biological role, there is no reason why such actions should not be specified by the imperative content of the corresponding pain experience.

Imperativists might account for intestinal pain experiences or headaches, for example, by construing them as commands to warm the abdominal wall, communicate the need for help, or avoid stressors. Klein (2015a) also leaves room for imperatives directed towards the entire body, such as demanding rest or refrain from any activity, though he actually associates them with nausea and fatigue. While this seems to be a promising option, significant changes in Klein’s theory would have to be made. In particular, the close connection between felt qualities and categories of demanded actions dissolves. Not all cramping or all aching pain experience would require the same action. Nor would all commands be directed towards the body part where pain is experienced. It follows that even the most sophisticated version of imperativism can apply, at best, to part of our pain experiences. Visceral pains and headaches cannot be identified with the type of imperative content that Klein assumes to unify pain experiences. The criterion of necessity is not met.¹³

As a final way out, an advocate of imperativism might provide a more complex biological story. For example, one might assume that the pain system *originally* evolved as a system that produces

¹³ The issue emerging due to such kinds of action that do not fit into Klein’s picture of protection imperatives might further extend to other kinds of pain experiences. For example, people burning their hand on a hot plate do not merely withdraw the hand, but will also scream and search for cold water (Aydede and Fulkerson, 2019). People who bump their knee will also groan and start rubbing the affected area (Bain, 2011). Assuming that these actions somehow serve the biological benefit of keeping the body intact: why should these kinds of action be ignored in the construction of protection imperatives?

protection commands as indicated by Klein. This system, like any other, is prone to misfires. Some of these misfires might have found an adaptive function on their own later on in evolutionary development. As such, some pain experiences might motivate appropriate actions that, however, do not correspond to the imperative content accounting for the original biological role of the pain system.

Klein offers a strategy to explain the occurrence of pathological cases based on biological stories that refer to commands that are beneficial in some circumstances but not in closely related ones. He provides such a concrete biological story for headaches:

The most adaptive system might have reason to cause pain due to transient ischemia (perhaps to regulate exertion), and it might be unusually sensitive to transient ischemia even though the head muscles aren't involved in vigorous exercise. One has only so many options for building a body when you start from a single cell each time. That process apparently spreads receptors far and wide, including places where they're less useful. (Klein, 2015a, pp. 114–15)

It is unclear whether Klein also wants to relate ischemia with pain in muscular organs. The biological story would be the same: presenting a command that proves useful in relation to *striated*, i.e. voluntarily controllable, muscles and claim the occurrence of the same command in relation to *non-striated* muscles. Accordingly, the experience of bowel cramps expresses the same demand for limitation of muscular activity as the experience of cramps in the femoral muscle during running exercises due to the occurrence of the same receptors in both tissues.

One might continue this biological story assuming that the innate misfires of the pain system found another function through *exaptation*. For instance, headaches became adaptive in the elicitation of avoidance behaviours concerning the entire body that were not available to organisms in which the pain system has originally developed. Intestinal pain experiences became adaptive with the evolution of animals that can actively manipulate their body and substantially rely on social interaction. Unfortunately, the suggested explanation is either highly speculative or not empirically supported. We do not exactly know when and how the pain system developed. At least 'fight-or-flight' reactions associated with cluster headaches are certainly part of an evolutionarily old repertoire of skills. Moreover, there is no evidence for the development of non-striated muscle tissue from striated muscle tissue. By contrast, some studies indicate that the

muscles of inner organs evolved independently (e.g. Seipel and Schmid, 2005).¹⁴

4. Impure Solutions

The previous considerations indicate that the imperative content that Klein proposes is neither sufficient nor necessary for pain experiences. Cases of fear and disgust can fulfil the same biological role as pain experiences in relation to the body's proper functioning. Some pain experiences, especially visceral pains and headaches, fulfil the envisaged biological role but not in a way that matches the protection imperatives Klein has in mind. In reply to these issues of demarcation and unification, one could try to alter the type of imperative content associated with the phenomenal type of pain experiences. Impure versions of imperativism provide a promising option to do so, as they relinquish the idea that pain experiences are exclusively constituted by imperative content. Instead, they paradigmatically combine an indicative with an imperative aspect (Hall, 2008; Martínez, 2011). Theories of this kind have three decisive advantages.

First, their imperative content preserves the motivating phenomenology of pain experiences. Pain experiences are still supposed to immediately drive subjects to perform certain actions. Second, the imperative content alone is not considered sufficient to make an experience a pain experience. Thus, the problem of demarcation seems less serious. Third, defenders of impure imperativism can account for differences in location, intensity, or quality, assuming that they rely on differences in indicative content. The problem of unification, which is based, *inter alia*, on the requirement that experiences of similar quality command similar action directed towards the body part in which the pain is experienced, may vanish. Taken together, it seems that impure versions enable us to save imperativism by avoiding the challenges that pure versions face. As I will now show, this is not the case.

Richard Hall (2008) is the most prominent defender of the view that the intentional content of pain experiences is composed of an

¹⁴ An additional biological story would be needed for organs, such as spleens, testicles, and ovaries, which are of non-muscular tissue and also sensitive to pain. This is especially true as some of the corresponding pain experiences seem to produce quite appropriate reactions, such as the defensive motion men typically perform when being hit in the testicles, as Klein (2015a) and thousands of videos on the internet confirm.

indicative content that informs the subject about the body's condition as well as an imperative content that demands the subject stop what they are doing with respect to a certain body part at a certain moment. Klein's earlier version of pure imperativism relies on the theory developed by Hall. As such, the same problems may affect Hall's theory, and perhaps even more than Klein's. For example, it remains questionable which actions directed towards the head or intestines are prohibited by migraine attacks or bowel cramps (Bain, 2011). Moreover, pain experiences demand appropriate actions other than the limitation of present motion (Klein, 2015a; 2017).

One might assume that the impure solution is promising even though the imperative suggested by Hall is not well-chosen. In reply, a defender of impure imperativism might posit that the imperative component merely expresses the command to stop doing something without any particular bodily direction. As such, the issue that actions with specific body parts have to be interrupted is avoided while actions concerning the entire body could be included. A migraine attack might not demand the subject stop doing something with the head but stop activity all together. However, the issue remains that some pain experiences contribute to bodily protection without limiting motion at all (see again Bain, 2011), such as those experiences related to sunburns or stinging nettles. Hence, with respect to the imperative part of the intentional content, the *problem of unification* is not solved.

As another alternative, one might posit that the imperative content expresses the command to act in some way or another. Even if the imperative content does not need to account for variation in location, intensity, or quality, it seems crucial to preserve the intuition that has motivated imperativism in the first place. That is, the intuition that pain experiences demand *specific* actions is to be preserved. Hall's theory (2008) is still based on the assumption that pain experiences produce actions that differ from those of other sensations. In a sense, this solution remains subject to the *problem of demarcation* because the general motivation to act is obviously not distinct for pain experiences.

Finally, I will consider a further alternative defended by Manolo Martínez (2015), who integrates the indication of a bodily state into the imperative content of pain experiences, instead of combining indicative and imperative content. His account thereby inherits the previously outlined advantages of impure theories (see also Klein, 2017), while bypassing the need to explain how the indicative and imperative contents are supposed to be connected. According to this

view, the imperative content of pain experiences demands the subject see that a bodily disturbance does not exist. Martínez (2015) highlights that such an imperative is quite flexible, as subjects may obey it in various different manners, including those active and passive actions of avoidance that Klein had in mind. Moreover, the pain experience of sunburn may reasonably motivate the tending of the skin with cooling cream; the experience of a headache, the taking of painkillers; and the experience of bowel cramps, the consultation of a doctor.

What might seem an advantage at first glance reveals a decisive problem. The actions possibly linked to pain experiences are now too numerous and sophisticated to be immediately motivated by the imperative content. For example, taking painkillers is not among the actions that might be traced back exclusively to a phylogenetically and ontogenetically basic action-guiding system. Moreover, the command to see that a bodily disturbance does not exist is by no means informative with respect to the manner in which the concerned subject is supposed to act. It, thus, seems necessary to abandon one of the core assumptions of imperativism: that pain experiences directly motivate certain actions without further thought.¹⁵ On the other hand, the respective imperative might also apply to emotions, such as fear and disgust. This is especially clear if we consider the biological function they fulfil in the removal of actual present disturbances as well as possible future ones. For example, by withdrawing the hand when a spider approaches, the concerned subjects sees to it that (potential) body damage, caused by bite wounds or poisoning, does not occur.

5. Conclusion

Imperativism constitutes an innovative approach to pain experiences in a debate that has long been dominated by indicative versions of strong intentionalism. Yet, as I have argued in this paper, there is no intimate link between pain experience and action that provides a necessary and sufficient imperative. Although pain experiences typically reveal a strongly motivating phenomenology, considerations concerning their biological role do not reveal a specific type of action that all and only pain experiences reliably motivate. Even impure

¹⁵ Similar considerations motivate Klein (2015a), among others, to prefer protection imperatives to so-called removal imperatives suggested by Martínez (2011; 2015).

versions of imperativism, that combine or blend imperative and indicative aspects, are not able to finally meet these challenges; at least not without giving up some of the most basic intuitions of imperativism. So far, imperative theories do not provide a satisfying answer to the initial question of what makes an experience a pain experience.

Whether this forces us to adopt a non-reductive position (Pautz, 2010), or whether psychofunctionalist accounts prove a more attractive alternative (Aydede and Fulkerson, 2019), must be the subject of further debate. Given the advantages of imperative theories, it might be worth considering further solution strategies. It should also be noted that the challenges raised here relate only to those arguments that are supposed to support imperative theories in the light of their biological function. Arguments addressing, for example, their motivating phenomenology or related neuronal processes are not affected.

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