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Introduction

This article uses two examples from theatre fieldwork to elucidate the ways in which lighting programmers facilitate the work of the lighting designer, positioning them as members of both the creative and production teams.[1] I will additionally use some empirical examples to show how programmers can use language to support their relationships with lighting designers.

Development of the lighting programmer

While it is not the goal of this article to fully detail the historical development of the lighting programmer, it will be useful here to briefly track the changes in the role and the concurrent shifts in the role of the lighting designer and lighting technology.[2]

Lighting operators have, of course, been around since before the introduction of electricity: candlesnuffers were employed in indoor playhouses as early as the 1600s, and the move to gas lighting required specialists to operate theatres' gas taps (Palmer, 2013, pp. 225–230). Following the advent of electricity, the operator's role continued to evolve – as technology improved, theatres moved from direct control dimmers operated by multiple technicians from an offstage wing to remote control dimmers operated by a single person at a compact console with full view of the stage. While the manual operation of the former required considerable dexterity and skill, the operation of such consoles from backstage limited the operators' view of the stage. Lighting states were decided on by the producer and set designer in the auditorium and relayed to the stage manager and/or chief electrician, and then finally to the board operators. In his 1933 book *Backstage*, Peter Godfrey described a typical plotting session:

> "I want more light on the back," cries the producer.
> "Two more floods upstage, Bill," says the stage manager.
> "What mediums, sir – amber or pink?"

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[1] While this appears to be now standard industry nomenclature, the divisions between cast, creative team and production team are sometimes contested (see for example Brennan, 2011). For my purposes here, I include designers and the director in the "creative team" and technical staff and stage management in the "production team". However, as will be seen, the lighting programmer often sits between these two "camps" or, indeed, in both simultaneously.

[2] For more in-depth information on the history of the lighting operator/programmer, see Morgan (2005), Palmer (2013, pp. 225–247), Baugh (2005, especially chapter 10), Rebellato (1999, pp. 89–94) and White (1999), among others.

"Neither," says the producer. "I want to try white."

"How's that, sir?"

"No good. Check them down. That's too much. Bring them up again. What are they now?"

"Half-check, sir."

"Not enough. Bring them up … slowly. *Slowly!* More yet."

"They're up full, sir."

"Oh, all right; put in a pink."

"How's that sir?"

"No good. Try an amber. Hmm…I don't like it. Try the pink again. Now try a straw. Let me see the amber again. That's not rich enough. I want a Number Four [Medium Amber]."

"Put in a Number Four, Bill… Eh? Oh! That *is* a Number Four, sir."

"Then frost it. All right, that'll do."

…and so on. (p.90)

In his autobiography *Northen Lights* (1997), Michael Northen, widely considered to be the first lighting designer in Britain, confirms this state of affairs:

Lighting a show in those days was a long tedious business. The Grand Master switchboard had each of its dimmer switches identified not by circuit numbers as today, but by a long description of exactly where the lamp was positioned on the stage. For example if I wanted to bring in a lamp which was somewhere in the flies, I had to remember to call out, 'Please may I have OP Fly centre white' and with luck the right lamp would come up. Today each lamp has a circuit number and all you have to call out is 'Circuit 80, please.' (pp. 103–104)

Technological advances necessitated concomitant shifts in personnel and job descriptions (Rebellato, 1999, p. 83), with electricians gradually moving into design roles (in practice if not in job title). Employing a lighting designer or "lighting expert" did not become common practice in Britain until the 1950s – and even then, there was some resistance from directors and producers. The former director of the Old Vic Theatre, Tyrone Guthrie, advised that "a wise producer lights in collaboration with the designer. I do not see the need for a 'lighting expert,' though an expert electrician is, of course, vitally important" (Bentham, 1952, p. 11).

Developments in lighting in the UK were largely due to the influence of Fred Bentham (1911–2001), the head of research and development at Strand Electric. In one of the many articles he wrote for *Tabs* magazine, which he also edited, Bentham (1951) advised on how to conduct a lighting rehearsal. He advocated issuing a synopsis of the show to the lighting operators, as well as details of the lighting changes required and their purpose. Bentham hoped that this would encourage operators to be interested in the execution of the cues beyond the simple mechanical movement of

levers. Bentham maintained that a lighting designer should be an artist first and a technician second. His creation of the Light Console in 1935 transformed the role of the lighting operator, by combining it with the lighting designer to create a single designer-operator able to "paint" with light at a control desk with a full view of the stage. There was no capacity for presetting states on a Light Console, allowing the operator to become an integral part of each performance.

Preset desks were preferred by directors, as multiple states could be arranged in advance and the operator could fade between these states at a predetermined speed. From the producer's point of view, this stability in the operation of the lighting in performance allowed them to continue to exercise full creative control of the process, even after press night. Lighting states could be easily recalled and replicated for each performance, and therefore the interaction between the operator and the performance was considerably diminished. This passing of control back to the producer came "at the cost of any further development and autonomy" (Rebellato, 1999, p. 94) for the lighting designer. What Bentham advocated instead was the lighting operator as an active, dynamic part of productions, realising the potential for differences in the rhythm of the action on stage and, therefore, the execution of the lighting in response. However, with the advent of computerised preset control desks, operators have once again become removed from the action on stage. They are no longer required to be an active participant in the performance – instead, they react primarily to "go" commands given by the deputy stage manager. This is not to say that it is not possible to be actively involved as an operator, but that the degree of interactivity required between the operator and the performance has decreased substantially.

In some cases, especially in producing theatres with in-house staff, the lighting programmer and operator may be the same person. In contemporary practice, the lighting operator is responsible for the production once it has opened and been finalised (or "locked down") by the lighting designer and programmer. They are not usually expected to alter or amend the look of the lighting states, their timing or their position in the action after press night without explicit instruction from the lighting designer (though in some cases the designer and operator may be the same person, for example in small-scale touring or devised work). In recent years, scholarly interest in the potential of the lighting operator has increased considerably. Hunt (2012) positions the lighting operator as a performer, creatively engaged in the realisation of a performance, and his subsequent writing also specifically advocates for a more active role for lighting operators, whom he calls – following Bentham – "lighting artist[s]" (2013a). However, this level of agency is not generally afforded to lighting operators in contemporary practice.

The lighting programmer as a discrete profession is a relatively recent development in UK theatre production. The advent of computer-controlled lighting consoles in the 1970s in the UK led to the rapid expansion of this specialised role, as the technology

– particularly the addition of automated lighting fixtures – became increasingly complex for one person to handle. Early moving lights could also only be controlled with the same manufacturer's console, necessitating separate programmers – one for the "generics" and one for the moving fixtures. Modern lighting consoles are now capable of controlling any number of generic units as well as moving fixtures across multiple manufacturers, and on all but the very largest productions one programmer is solely responsible for controlling the entire lighting rig.

The specific role of the lighting programmer in contemporary theatre seems difficult to define clearly.[3] The Association of Lighting Designers (ALD) in the UK has published on its website a very basic document outlining what a programmer should know, but notes that this forms "only the core part of the *syntax* required to enable someone to input data into the desk [my emphasis]" (Association of Lighting Designers, n.d., n.p.), reducing the role to a merely procedural, functional one. However, the job of the lighting programmer goes far beyond mere data input. As Schiller (2016, p. 135) notes, the ability to form a successful working relationship with the lighting designer is "just as important as the knowledge and skill" that a programmer must also possess. Interestingly, professional programmers in the UK seem reluctant to formalise any attempt at a job description – this ranges variously from a "data entry clerk" (anonymous, personal correspondence, 14 June 2018) to "acting as the interface between the designer's vision and the technology of the lights and lighting console" (Halliday, n.d., n.p.). Both of these comments point to the programmer's role as a mediator between design and technology, and both seem to prioritise the more practical, manual processes in which they engage. Programmers, however, often fulfil both creative and technical roles. The former is difficult to quantify, but this duality is evident in interviews and conversations with lighting designers. Lighting designer Paule Constable maintains that being a programmer is "more than data input. It is a collaborative process" (cited in Moran, 2016, p. 101), and lighting designer Mark Henderson agrees:

> They [programmers] are so vital for their speed and efficiency, but also for their input as well. […] [T]hey know what the lights can do – probably better than I do. They work with them all the time. In that environment they are able to offer up suggestions and have an input, which is great. […] The good ones really know their rig and how to help you get the best from it. (cited in Moran, 2016, p. 100)

The bulk of the lighting programmer's work occurs during the pre-production and production periods. This work may include being involved in the research and development stage, such as helping the lighting designer and director visualise possible lighting states and explore potential routes before moving to the theatre. This

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[3] For an overview of contemporary practices, see Schiller (2016), Pilbrow (2000), Halliday (2010a, 2010b) and Moran (2016, 2018), among others.

is often the case with devised or technically complex productions. During the production period, the lighting programmer is most often situated at a production desk in the centre of the auditorium, next to the lighting designer. The production desk acts as a "'nerve centre' or 'point of command'" for the production team as well as a "centre of social space and activity" (Hunt, 2015a, pp. 15–16), placing the lighting designer and programmer in the literal centre of the production activity. In much the same way that the lighting designer acts as a "bridge" between the artistic language of the director/choreographer (often positioned to the lighting designer's left) and the technical or syntactic language of the lighting programmer and console (usually to the lighting designer's right), the lighting programmer facilitates communication between the production desk and the lighting and other backstage crew. The programmer must have detailed knowledge of the lighting console and also simultaneously be aware of the needs of the production generally, so that they can feed back any pertinent information to the lighting crew. In the UK, where the roles of associate and assistant lighting designer are not yet commonplace, very often the lighting programmer fulfils one or both of these functions as well. According to lighting designer Lucy Carter, a good programmer is "more important to me than having an assistant, and they kind of do become your assistant because they've got a creative role too" (cited in Moran, 2016, p. 101). It is clear that the lighting programmer possesses an exceptional combination of technical, artistic and logistical knowledge, which is facilitated by not only their physical location at the production desk but also the operational space they occupy between the creative and production teams.

Hunt and Melrose (2005) advocate for the position of the lighting programmer as a creative technician. The authors argue that these professionals embody more than just technical knowledge; they are "mastercraftspersons" who possess a wider understanding of the production process, how and where their role fits in, and how to manipulate and exploit the limits of their role within the rules of production. These skills come into play most significantly when the person or process is under pressure (for example, during the production period), as demonstrated by the case study in the margin of this article, which clearly shows the potential scope of the lighting programmer's role beyond simple data input. This case study further serves as a demonstration of the potential of the lighting programmer's effect not just on the process but also on the aesthetics of a production. This will also be seen in the examples from my fieldwork that are analysed below.

Both designer–programmer relationships in the selected examples below are longstanding partnerships that have developed over time. According to Altman and Taylor (1973), the language of "intimate" speakers (i.e. those with deeper, established interpersonal relationships) is more personal and empathetic. Close collaborators such as the ones I have observed here seem to sit in Altman and Taylor's "affective" stage of social penetration, in which an idiolect develops between interlocutors, who feel comfortable enough to engage in critical discussions with each other. There was often

a "shorthand" form of communication used by this "ingroup", which usually included intertextual references to other practitioners' work or the previous work of the ingroup. This practice has clear implications for the communicative potential of lighting teams: freelance designers and in-house (rather than freelance) programmers with whom they may work only occasionally may take longer to establish a common language or vocabulary within which to work.

Methodology

As part of my current research, I spent approximately eighteen months conducting eleven separate periods of fieldwork in theatres around the UK, observing lighting designers, lighting programmers and directors at work during technical rehearsals. Using a linguistic ethnographic approach, my aim is to provide some insight into how these professionals use language in a collaborative environment to exercise agency and navigate creative hierarchies. I am specifically interested in the processes that occur during technical rehearsals as this is "a period of often intense activity" (Moran, 2016, p. 27) and "intense creativity but also of anxiety and strain" (Hunt, 2015, p. 1). For the lighting designer, the technical rehearsals are often very "expos[ing] – 'like standing naked on a table and asking "what do you think?"', as lighting designer Mark Jonathan puts it" (cited in Moran, 2016, p. 27). This pressure is compounded by the fact that light is the only visual design element that cannot be experienced outside the performance space. For example, set designers will often produce physical scale model boxes with tangible, material properties that can be felt, observed and tested before arriving on stage. As with the costume design, these elements are built over multiple weeks and can be experienced, commented on and, most importantly, altered during the pre-production period. Equally, both set and costume retain their physicality beyond the performance, unlike light and indeed sound. Light's dependence and effect on time and space, however, mean that the full extent and potential of the lighting designer's contribution remains largely unknown until entering "the white hot pressure cooker that is the production period" (Levings, 2011, p. 4).[4] Technical rehearsal days tend to involve the most negotiation and adjustment as creative teams (especially the lighting designer) learn to navigate the aesthetic "language" and "grammar" of a production while also refining the spoken language and grammar they use to articulate these aesthetics. As my primary interest is in the language used in the process of creation, it therefore made sense to focus my attention on this "cauldron of potential" (Moran, 2016, p. 50). It is over this period that the light on stage is realised by the lighting designer and is first seen and experienced with other design elements, making this a critical moment in the creation of a production.

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[4] James Simpson, lighting visualiser at the Royal Opera House in London, is currently undertaking PhD research in using visualisation tools (primarily virtual and augmented reality) during the design process, and it will be interesting to see how his work in this area affects the exploration and experience of light during pre-production.

The examples that follow come from two of the longer durational observations I undertook. Participants agreed to take part in this study on the condition of anonymity; therefore, speakers are identified by their production role rather than by name or initials. Where someone has been referred to by name by another speaker, I have redacted this and replaced the name with the production role in square brackets. The generic "they" is used throughout the examples for the purposes of anonymity.

Example 1

Example 1 comes from a West End musical with entirely freelance creative and production teams. The lighting designer had never worked with the designer or director before, though their relationship with the lighting programmer was very well established as they had worked together on many productions over several years. This led to an interesting dynamic in which the programmer had significant decision-making power and would often pre-empt or second-guess the lighting designer. The lighting programmer was (and still is) one of the top programmers in the country and is very well respected and experienced; this position and clout no doubt facilitated their expansive remit and level of responsibility within the team. This production also employed both an associate and an assistant lighting designer, which (as noted above) is fairly uncommon in UK theatre practice. The atmosphere during the first week of technical rehearsals (from which the example below is drawn) was often very tense: on at least two occasions, the director shouted at the lighting designer and was overtly rude and disrespectful. The director often had trouble articulating the precise nature of their objections to the design, leaving the lighting designer to attempt multiple iterations of potential solutions in order to decipher the director's meaning. The programmer's input and skill were vital here in providing a flexible framework in which the lighting designer could work, enabling them to respond to the director's demands in a fluid, dynamic and improvisatory way.

The transcript below demonstrates the programmer's potential influence on the dynamics of the production process. This exchange comes from the second day of technical rehearsals, after a particularly rushed first day. The design team, along with the deputy stage manager, has decided that it is best to slow the technical rehearsal down to ensure sufficient time is spent on the design elements. The director is located at another production desk in the stalls, closer to the stage, and is not on headset, so is out of hearing range.

```
Lighting designer: This is the new, slower tech style, isn't
it?

Programmer: We are, absolutely. And I am more than happy to
cop some of the flak for that. I will go slower if I need
to go slower.
```

```
Lighting  designer:  It's  just  -  it's  a  request  from
everybody.

Programmer: Good. I just - it's mad.

[…]

Lighting designer: It's the conversation we had last night.

Programmer: But [the director] doesn't listen. Don't worry;
I'll just be really shit at programming today. And then
we'll just go back to the…

Lighting designer: Just let me know when you're being shit
and when you're not being shit.

[Laughter]

Programmer: Thanks, [lighting designer]. I would hope that
you would notice.

[Laughter]
```

This excerpt clearly demonstrates the impact of time on the creative process. This is made explicit throughout many of the observations I have undertaken. Technical rehearsals for this production took place over three weeks, during which most morning sessions were specifically dedicated to lighting. This may sound like a luxury; however, this time was very focused and demanded the full attention of the lighting programmer and lighting designer at all times.

In regional and/or producing venues, most production schedules include at least one dedicated lighting session before the main work of the technical rehearsals starts. However, in practice these sessions very rarely happen as planned; there are often members of other departments working during this time, and lighting sessions occasionally occur with some level of "working light", both of which impinge on the lighting designer's ability to prepare adequately for the start of the technical rehearsal. While the morning sessions during this production period were specifically dedicated to lighting, there was a considerable amount of plotting done while other departments worked, particularly on scene changes, and of plotting under working light. Lighting designer Neil Austin explains that this time is crucial for a lighting designer:

> The whole problem with lighting is that it's indescribable to other people beforehand, and […] even the best of imaginations can't always foresee exactly what it's going to look like until you are in the space. That's why lighting time is so very important (cited in Moran, 2016, p. 63).

It is equally important that the lighting designer and programmer be allowed to use this time to create potential lighting states and to get a feel for what the "language" of the production will be – sometimes with the director or choreographer – prior to the

pressure of the technical rehearsal. In order to produce a lighting design, lighting designers must "do" lighting design – it is both a process and a product, both a "doing and a thing done" (Hannah and Orsløf, 2008, p. 13). The process requires time to experiment, time to discuss, and, often, time to fail, none of which was being facilitated in this production period, to the detriment of the design elements and thus the production itself. The programmer's willingness to put the designer's artistic and professional integrity above their own in defence of the production's aesthetic speaks volumes about the programmer's empathy – an attribute that far exceeds the minimum expectations of their role. What is particularly striking about this example is the extent to which the programmer is willing to take responsibility and potentially endure criticism (or "cop the flak") from the director for their actions, thereby saving the lighting designer's personal and professional face should they be challenged.

Example 2

Example 2 comes from a new dance production, in which the lighting designer and choreographer had worked together for over twenty years, and the programmer and lighting designer had worked together for several as well. This production had a long period of research and development during which the lighting designer and programmer used visualisation software to explore preliminary ideas with the choreographer. This period was then followed by a week of lighting exploration in a theatre (though not the final performance space), with the production desk located in the centre of the stalls. When rehearsals moved to the actual performance space, the production desk moved to the circle level. This meant that the proximity of the production desk to the lighting rig changed, requiring the choreographer and lighting designer to consider the aesthetics of the rig itself, which was now a much more prominent feature than it had been when viewed from the stalls level of the rehearsal theatre. As in example 1, the programmer needed to be flexible and responsive in helping the choreographer and lighting designer explore solutions necessitated by this change in proximity.

The design for this particular production included some very complicated pixel mapping sequences, some of which proved difficult to realise. The level of complexity meant that the programmer exercised a high degree of autonomy over the plotting of the show. However, this sometimes led to a blurred sense of the ownership of the work. The lighting designer explained an effect they wanted to see to the programmer, who spent several minutes creating the desired effect. When showing it to the choreographer, the following conversation ensued:

> ```
> Lighting designer: And then what I've done is – and that's
> a group of lines on each side. Then I've added another group
> of lines that goes here as well, so you multiply. And then
> all the lines go all in that direction.
> Choreographer: Why did you do it that way?
> ```

```
Lighting designer: Because I just felt like we were doing
diagonal sweep this way a lot, but we can reverse it and
they all go that way – that doesn't matter.
```

When it transpired that the choreographer wanted to try the effect in reverse:

```
Lighting designer: At the moment, they're going that way,
so I'll have to reverse it if you want that.
```

In both extracts, when speaking to the choreographer, the lighting designer uses a first-person pronoun when the third person would have been more correct. It is the programmer who has done the physical and mental work of translating the lighting designer's idea from rather abstract, non-concrete language into computer syntax. Pronouns belong to a group of words called deictics, which are used to indicate time, place or person. Deictic expressions are meaningless without a referent; they are "semantically insufficient to achieve reference without contextual support […] provided by the mutual attention of the interlocutors and their ability to reconstruct the speaker's referential intentions given clues in the environment" (Levinson 2006, p. 103). The referential function of deictics gives them an inherent identity-creating role, and this identity is created by the speaker, who places themselves in relation to other speakers/addressees, places or spaces through language. A shift in deictic usage or a deictic substitution can therefore indicate a change (intentional or otherwise) in the speaker's identity or perceived identity.

Therefore, an important function of deictic expressions is to communicate proximity to the speaker, and this distance is understood within the context of the conversation. What the lighting designer has done in both the examples above is replace what should be a third-person plural pronoun (*we*, *us*) with a first-person singular pronoun (*I*, *me*). The lighting programmer has, in fact, done the work; they have spent a significant amount of time and effort in translating abstract language into syntax, numbers and cue lists. Using the first-person singular here denotes ownership and proximity, therefore indicating how the perceived identities of the lighting designer and the lighting programmer, whose work has been appropriated, have shifted. However, as in example 1, the programmer sacrifices their own professional sense of ownership in service of the larger team and the production's aesthetic. This balance of individualism versus collectivism is a fundamental quality of successful collaborations. When individual agency and group communality co-occur in such a way that neither dominates, this leads to collaborative success (Moran & John-Steiner, 2004, pp. 20–21).

Conclusion

In the examples given above, I have positioned the lighting programmer as a key collaborator in the lighting design process, in particular during lighting plotting sessions and technical rehearsals. The relationship between the lighting designer and programmer is of paramount importance during this part of the production process, and

the ways in which this relationship is supported are manifold. As demonstrated through these examples, lighting programmers play a key role in the development, evolution and realisation of any lighting design, and their impact stretches beyond that of the technical demands of the lighting console. While some programmers may describe their role as simply to "follow the instructions of the lighting designer" (Hunt & Melrose, 2005, p. 71), they must also be empathetic to the needs of the lighting designer and the other creative relationships in the theatre, and they must possess a clear understanding of their role in the process as a whole. As demonstrated here, being an excellent programmer is not merely a case of manual dexterity and syntactical know-how; it encompasses a range of interpersonal skills and empathetic awareness. Lighting programmers are vital in bridging the gap between the technical and the artistic aspects of lighting, and they often take on logistical responsibilities as well. This expanded role of the lighting programmer blurs traditional professional boundaries and hierarchies, such as those seen in the examples above. Acknowledging and respecting the increased responsibilities of programmers – particularly at a time when production ambitions are increasing at a rate that far exceeds that of improving working conditions (Town, 2019) – is imperative for the wider industry. Equally, programmers need to make a more overt and definitive claim to their expertise, which, as demonstrated, goes far beyond mere syntax. The combination of these actions will allow for a more collaborative approach to creating what Graham (2016) refers to as "scenographic light", recognising the dramaturgical potential of light on stage.

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